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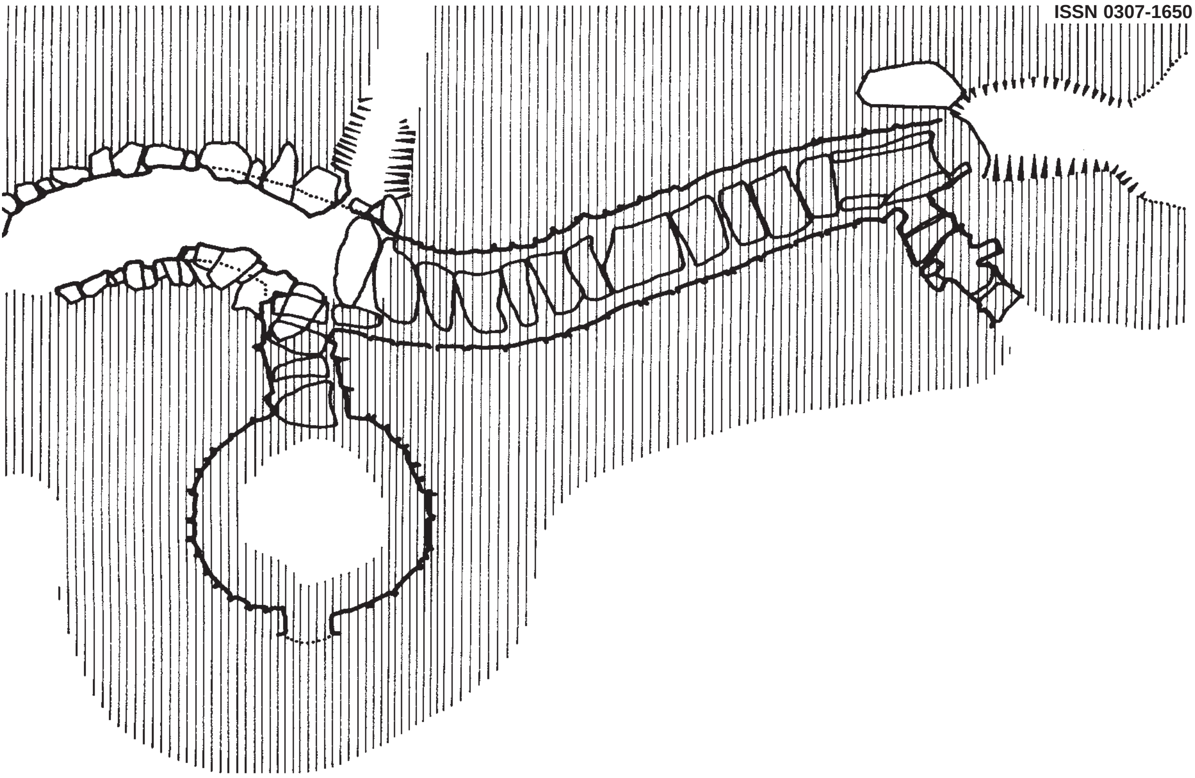

Subterranea Britannica

Bulletin 32

SUBTERRANEA
BRITANNICA

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Personnel

President	Professor C.T. SHAW Royal School of Mines
Chairman	Paul W. SOWAN 1 Chaucer Cottages, 7 Pilgrims' Way, Croham Road, SOUTH CROYDON. Surrey CR2 7HT [(T) 020-8688-3593]
Vice-Chairman	MC BLACK B.Sc., A.R.C.S., C.Phys., M.Inst.P. Hardknott, 25 Chadwell, WARE, Herts SG12 9JY [(T) 01920-467930 (M) 07880-980921 (E) vicechairman@subbrit.org.uk]
Secretary	Roger STARLING, 14 Maple Close, Sandford, WAREHAM, Dorset BH20 7QD [(T) 01929-553822 / (M) 07774-671499 (E) secretary@subbrit.org.uk]
Membership Secretary	Nick CATFORD, 13 Highcroft Cottages, London Road, SWANLEY, Kent BR8 8DB [(T) 01322-613787 (E) membership@subbrit.org.uk]
Treasurer	Sue MONSELL, 5 Railway Cottages, Old Station Way, BORDON, Hampshire GU35 9HH [(T) 01420-474502 (E) treasurer@subbrit.org.uk]

Committee	Linda BARTLETT Martin DIXON	
Co-opted	Day Conference Organiser	Andrew P. SMITH
	Web Site Manager	Mark A. BENNETT
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Editorial

THE BULLETIN OF SUBTERRANEA BRITANNICA
No. 32 – April 2007

It will perhaps be a surprise to some recently joined members that Subterranea Britannica has a Bulletin, as no issues have appeared since number 31 in February 2000.

From 1975 to 1985 we published two slender duplicated Bulletins each year. More recently (until 2000) we issued a more substantial Bulletin annually. Meanwhile a more frequently published duplicated Chairman's Newsletter was circulated to members, which evolved in time into a greatly improved Secretary's Newsletter compiled by Malcolm Tadd. In 2003 this was upgraded further by Dan McKenzie and issued as the thrice-yearly Subterranea with which members will be familiar.

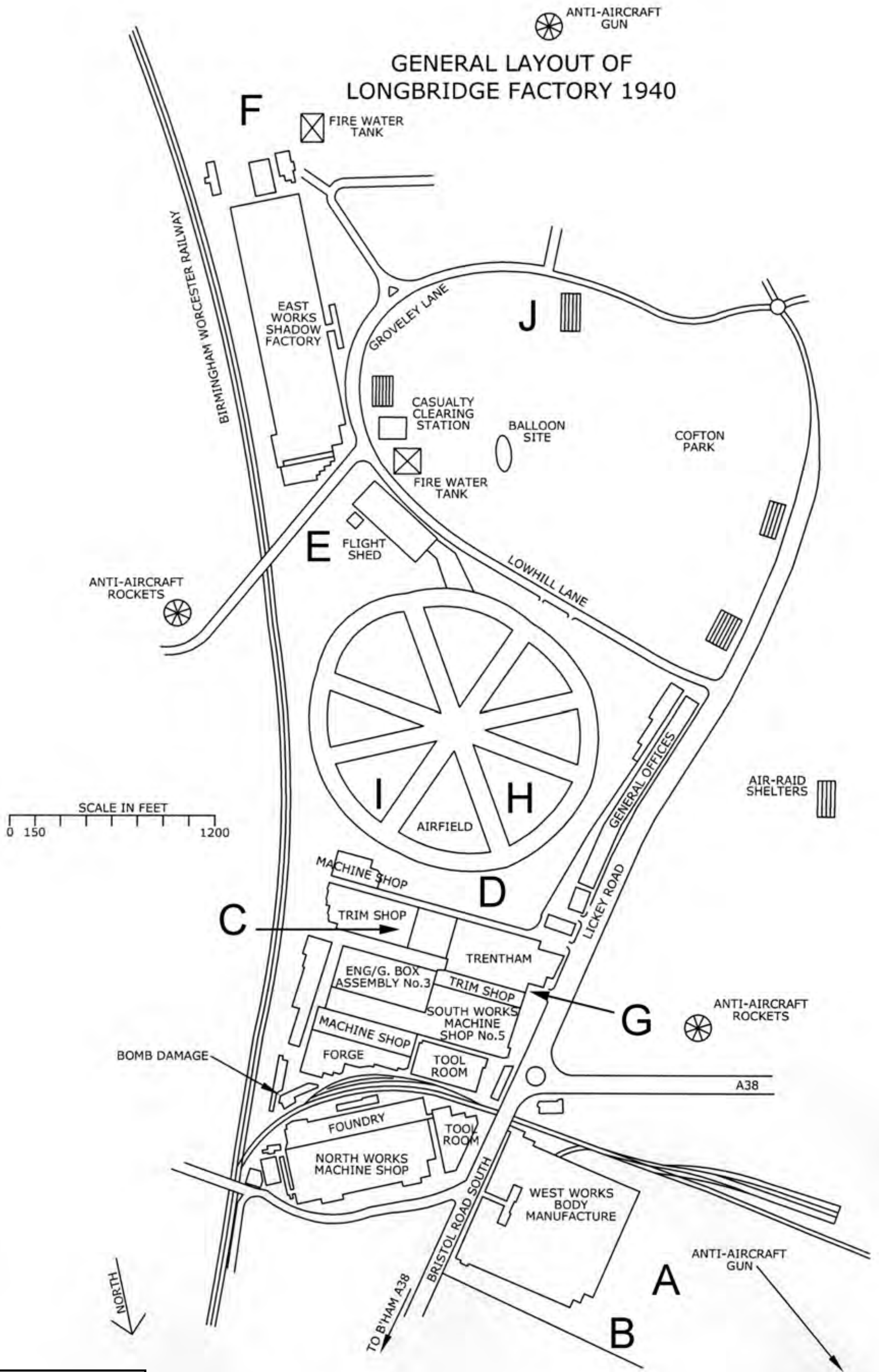
It has been decided to retain the Bulletin, to be issued at irregular intervals, as a vehicle for longer or more research-oriented articles, as and when these become available. The articles in this issue by our founder Sylvia Beamon and by Jonathan Gill have been ready for some time, and your Editor apologies to their authors for the inordinate delay in their publication.

The promise of an article on the silver-sand mines and tunnels at Reigate did not materialise, and your Editor the undersigned undertook to write this himself, from his own researches. Personal and domestic circumstances have so far prevented this, although it is hoped to have this completed for publication in Bulletin 33 in the not-too-distant future. Much editorial work has been done since 2000, also, in connection with a most interesting article about World War II German military tunnels in what is now western Poland, including extended correspondence with an academic at the University of Zielona-Gora.

To make this latter article as comprehensible as possible, it is necessary to compile a map to illustrate it, showing the strategic location of the tunnels in relation to the several positions of the German-Polish border from the 1930s to the present time, the local topography, the relevant civil and military railway branch lines of the 1930s, and the names (in German and Polish) and locations of all the villages and towns in the area. It is hoped that your editor will be able now, his domestic crises being at an end and family commitments greatly diminished, to finalise this article also for the next issue.

Paul W. SOWAN
Bulletin Editor

The Austin-Longbridge Underground & Its Culture



Plan drawn by Tim Robinson

The Austin-Longbridge Underground & Its Culture

Neil Wedgbury

Abstract: Austin's Longbridge car manufacturing plant about seven miles (11 kilometres) south-west Birmingham, closed in 2005, was one of the largest factories in Europe. Established in 1905, the factory manufactured military supplies during both World Wars. Extensive networks of underground tunnels and rooms are described, some made by true tunnelling, others by cut-and-cover methods. The original purposes of the voids, and their secondary uses are explained, and their recent or current condition described. Additionally, the culture and folklore of the workforce are recalled.

Keywords: England / Birmingham / Longbridge / Austin car manufacturing / munitions manufacture / air-raid shelters World War I / World War II.

FOREWORD

I wrote this article to place on record the underground complexes created at Austin's car manufacturing complex at Longbridge, Birmingham, before World War II, and to identify subsequent underground features resulting from an inherited culture. At the same time I have added items directly or indirectly associated with the underground areas, either specific or of general passing interest. The factory was at one time amongst the largest in Europe. It closed in 2005.

THE AUTHOR

I started work at Austin Longbridge in 1964 as a technical apprentice serving five years of an excellent introduction to engineering in many varied forms, and factory life in general. I officially specialised in all aspects of painting car bodies, and unofficially in only doing what I really found interesting, like investigating underground places. This was the play side of the apprenticeship but equally I can remember times of long hours and hard work.

On completion of my apprenticeship the future looked a little cloudy. A group of us cheekily asked management if we could become management trainees, and to our surprise they agreed. After working in many places as a foreman and senior foreman I eventually became a manager in paint planning and process, progressing on to new facility, model and quality projects.

After 37 years at Longbridge and 21 different jobs or projects, I was working on the new BMW Mini project as a project manager in painted body manufacture when BMW dropped their bombshell: it was proposed to close the factory. After much heart-searching I decided to take early retirement, which I have enjoyed ever since.

My retirement has given me the opportunity to research and compile this document. Whilst collectively, I probably know more than anybody else on the subject, it is only a small fraction of the complete story. I am sure that inaccuracies will exist, and would welcome any corrections, and additional information.

PART A - OVERVIEW

THE SITE

Longbridge is about seven miles south-west of central Birmingham, the factory site lying between the Birmingham to Gloucester railway line and the A38 Birmingham to Worcester road.

The ground is predominantly Triassic period sandstones and marls, pebble beds and breccia. The hardness of the sandstone varies from soft and easy to work to very hard and requiring jack hammers or breakers to dig it out. Some major faults named the Longbridge faults lie within the sandstone, but in general the ground is very stable and can be excavated with little or no shoring up. In some areas, mainly around the edges of the old flying ground, the ground is unstable due to the levelling of the hill and the dumping of foundry process debris, power station ash, coke and general rubbish. I remember one nightshift burying an A55 van body shell that had been crushed by the transfer beam when transferring from the conveyor tunnel to the build track in the CAB 1 building. We buried it because the maintenance manager had been threatened with the sack if it happened again, which it never did following some serious modifications. The groundwater level in the rocks has over the last fifty years got closer to the surface. This is a general fact in the Birmingham area, as industry has taken less and less water from boreholes for process industries. A disused borehole exists close to the works, close to Longbridge traffic island.

The ground is undulating, varying in height by around 150 feet. Most parts of the factory are sited on natural or man-made terraces. During World War I the main hill in the centre of the site was levelled by prisoners of war who removed the crown of the hill to the sides using picks, shovels and wheelbarrows to form a flying ground. The River Rea runs across the northern corner of the site in a tunnel under the factory. In the late sixties a further tunnel adjoining the North Works was constructed using cut-and-cover methods. This was required to prevent flooding of the foundry and railway system, and was useful to take the additional drainage from the new West Works Metro body factory. The

The Austin-Longbridge Underground & Its Culture

MAIN AUSTIN LONGBRIDGE UNDERGROUND AREAS

Area	Map	Construction	Approx length	Uses	Current Status
West Works No 1 complex	A	Half-round mined tunnel: steel lined.	1700 feet	Air-raid shelter: small amount of manufacturing	Does not exist - demolished 1977.
West Works No 2 Complex	B	Brick and reinforced concrete cut-and-cover tunnel: part may have been mined.	400 feet	Air-raid shelter: storage, possibly manufacturing, control centre?	70% survives - no access.
Trentham tunnel complex	C	Half-round mined tunnel: brick and reinforced concrete lined.	1000 feet	Air-raid shelter: small amount of manufacturing or storage.	Blocked in some places - no access.
Flying ground tunnel complex	D	Mostly half-round mined tunnel: steel lined with some inverted U-shaped supports And reinforced concrete in places.	3500 feet	Air-raid shelter: wages distribution, possibly manufacturing or storage.	Some areas pumped full of concrete - no access, variable condition.
East Works Underground Factory	E	Inverted U-shaped mined tunnel: steel lined.	1700 feet	Specifically aero-engine manufacture; also could be used as air-raid shelter .	Empty and disused, deteriorating with age - no access.
East Works tunnel complex	F	Brick and reinforced concrete, cut-and-cover tunnel.	600 feet	Air-raid shelter; control centre?	Blocked with concrete - no access.
Trentham WW2 HQ	G	Two upright entrance /exit cylinders joined by tunnel to large main cylinder: welded steel, RSJ and reinforced concrete.	100 feet	ARP Emergency services control and incident HQ.	Flooded, in very dangerous condition - no access.
CAB 1 Tunnels	H	Cut-and-cover reinforced concrete and steel RSJ.	2000 feet	Post-war manufacturing body and engine supply route.	No longer in use, condition fair - awaiting decision on site use.
CAB 2 Tunnels	I	ut-and-cover reinforced concrete and RSJ.	800 feet	Post-war manufacturing offices, wc, plant services, maintenance areas and parts supply.	No longer in use, condition fair - awaiting decision on site use, many areas filled-in.
Cofton Park	J	Brick and concrete	Not known	Air-raid shelter for Austin workers and Cofton Hackett civilians.	Filled-in and covered over in 1946-7

factory actually sits on a watershed, the river Rea feeding the Trent and the river Arrow running under the East Works site feeding the Severn via the Avon.

COMPANY HISTORY AND WORLD WAR I

In 1905 Herbert Austin [1866 – 1941], later the 1st Baron Austin, purchased the White & Pike Print Works at Longbridge in the then countryside some seven miles from the centre of Birmingham, creating there his car factory. Soon World War I loomed and the factory went over to munitions work. WW I air-raids were not that common, but they did occur over the larger cities. Zeppelin L60 was on a raid to Birmingham but, failing to locate the city, dropped its bombs randomly. At 23.00 on 19th October 1917 it found a well lit area and dropped its last bomb: it had by accident found Longbridge. No major damage was caused to the main factory buildings although allegedly two men were slightly injured. L60 was destroyed in its hangar by Camels flying from HMS Furious on 19th July 1918. Did the bombing of Longbridge in WW I influence Austin's subsequent actions before World War II? Maybe the die was cast for the future.

During WW I Longbridge produced eight million shells, 650 large guns, 500 armoured cars, ambulances, generators, pumps and many other war requirements. Amongst strange Longbridge products manufactured in 1917-18 were wooden coffins; these were required to cope with the influenza pandemic that occurred at this time. By 1917 the plant had expanded to 62 acres and included two new munitions plants and a flying ground. For all his efforts during the war, Herbert Austin was knighted in 1917.

Steam Navvy East Works 1936

INTER -WAR YEARS

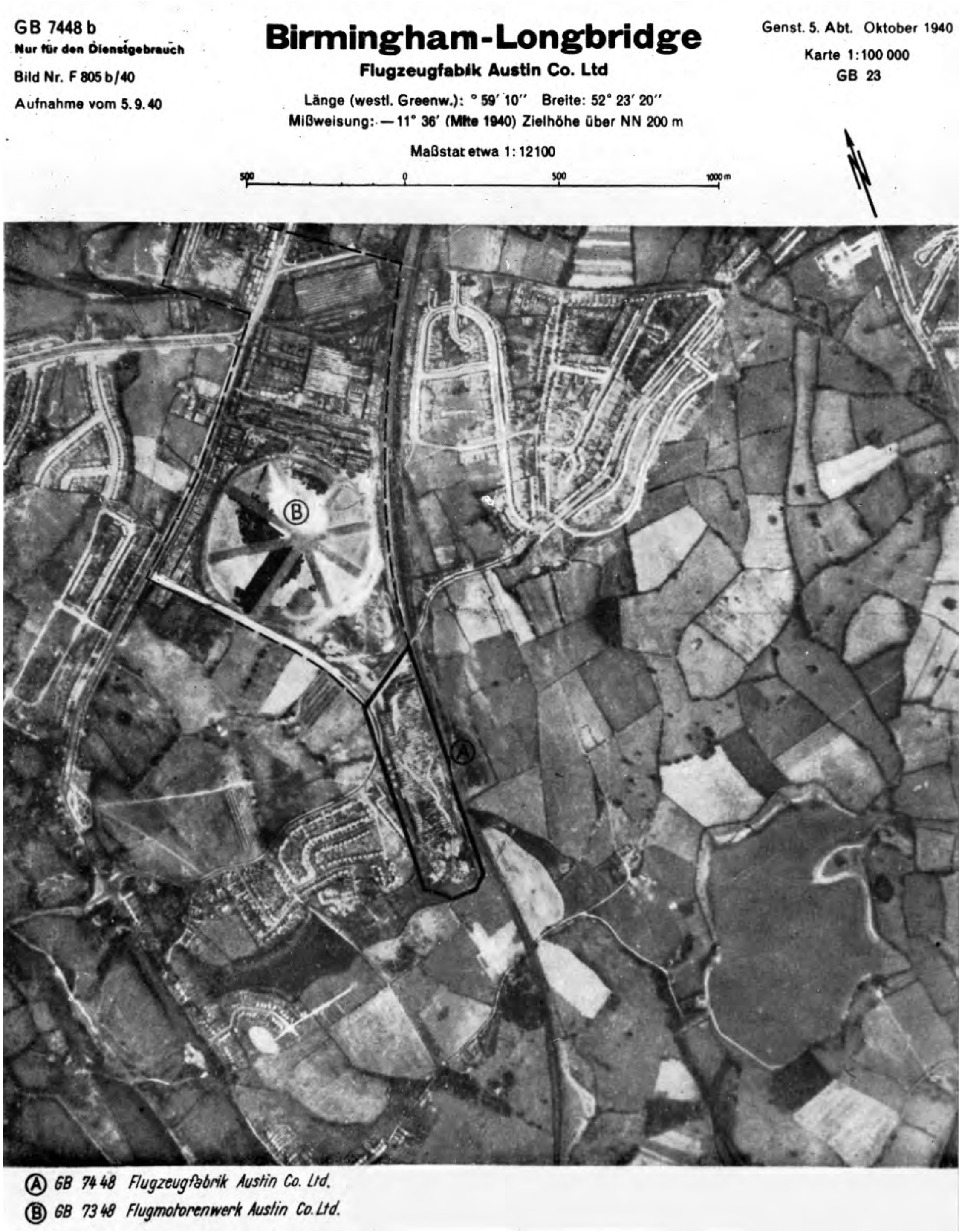
By 1919 the factory had resumed car manufacture and now also produced trucks. In 1936 Sir Herbert was made a Lord in recognition of his contribution (£250,000) to the Cavendish Laboratory at Cambridge run by his friend Lord Rutherford [Ernest Rutherford [1871 – 1937]], who succeeded in splitting the atom which directly contributed to the making of the first atom bomb. Also in 1936 Lord Austin became Chairman of the Government Shadow Factory Scheme for the manufacture of munitions in secret or protected sites across the country. The first and one of the largest was built at East Works, Longbridge. This was designed from scratch to produce aircraft on an assembly line. On completion of the factory, photographs and statements concerning its major role as an armaments factory were made public. This seems strange, but was probably a propaganda strategy aimed at the Germans, a futile attempt to make them abandon their war plans. At the same time the existing buildings were being converted to munitions production as well. To protect critical process machines, engine assembly and workers, a force of tunnelling miners was brought on site to drive into the sandstone hillsides a series of tunnels creating underground complexes within the works.

East Works Shadow Factory

The miners came from South Wales and were billeted in the immediate Longbridge area with mainly Austin employees, all arranged in a somewhat secretive manner. To further reduce their impact on the area a local Austin company house was converted into a club specifically for the miners' use. It was called the Greenlands Club (possibly a reference to the green-green grass of home). A club still exists on the site today.

WORLD WAR II

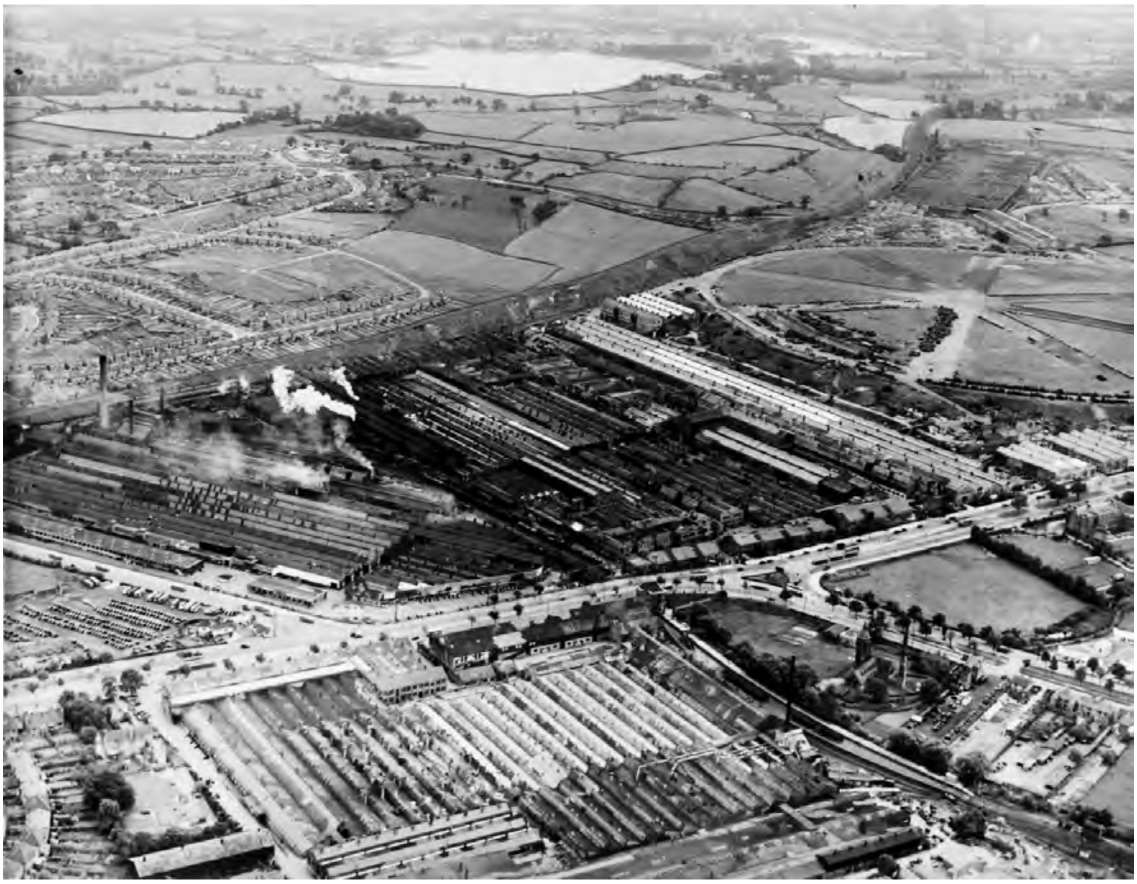
By 1937 the factory had increased to 220 acres. In the period leading up to the declaration of war a large model was constructed of the factory and people from art colleges, design architects and the Austin styling studio all gathered around it and were told to come up with a camouflage scheme that would effectively hide the factory from the expected bombers. The result was exceptionally effective, even trained RAF pilots failing to see the works when over-flying. This paint scheme became the standard and was used effectively on many other buildings during the war. In October 1940 the


GB 7448 b
Nur für den Dienstgebrauch
Bild Nr. F 805 b/40
Aufnahme vom 5. 9. 40
Birmingham-Longbridge
Flugzeugfabik Austin Co. Ltd
Länge (westl. Greenw.): ° 59′ 10″ Breite: 52° 23′ 20″
Mißweisung: —11° 36′ (Mitte 1940) Zielhöhe über NN 200 m
Maßstab etwa 1:12100
500
0
500
1000 m
Genst. 5. Abt. Oktober 1940
Karte 1:100 000
GB 23
Ⓑ
Ⓐ
Ⓐ GB 7448 Flugzeugfabrik Austin Co. Ltd.
Ⓑ GB 7348 Flugmotorenwerk Austin Co. Ltd.

German Aerial Photograph October 1940

Luftwaffe took an aerial photo of Longbridge: whilst the factory is not that obvious the flying ground stands out looking like a huge spoked wheel. The Luftwaffe identified the factory as the Austin aircraft and aero engine factory, so they certainly knew where it was and what it was. On north facing parts of the factory the camouflage can still be seen today, along with the damage to buildings caused by the only bomber, a Heinkel 111K, to hit Longbridge. As luck would have it the pilot followed the wet railway line reflections until he found the branch line running through the works and released his bombs. A number of workers were killed. At one of the funerals, on a cold and wet day, Lord Austin caught a cold which developed into pneumonia. He died aged 75 on May 23rd 1941 and is buried in Lickey Churchyard almost within sight and sound of his beloved factory. A vague rumour has raised itself more than once concerning the manufacture of parts during World War II in the well-equipped tool-rooms for research at Birmingham University. Under Sir Mark Oliphant, Professor Jones perfected the resonant cavity magnetron valve, enabling increased radar power (your microwave at home uses the same type of valve). Another team worked on atomic research, the results of which were transferred into the American Manhattan project to build the first atomic weapons. Both teams required accurate and unusual machining that Austin would have been capable of. It comes as no surprise that in 1940 Lord Austin was made a member of the University and presented with an honorary degree.

From 1936 through the war years the works engineers became quite skilled at creating underground workplaces and protected areas and were also involved in the plans of other companies. Before the war the Germans carried out extensive aerial reconnaissance of the Birmingham area, taking photographs and clearly identifying the prime targets including the Austin works. It was expected that these targets would be hit and industry severely disrupted. It was probably this expectation that caused the construction of the underground complexes. Not all the tunnels were used to manufacture items; most were for worker air-raid protection – stated to be up to 15,000 places, but some were kept in reserve to take the expected input of displaced manufacturing.



Longbridge 1946

The East Works underground factory was specifically built and used for manufacture: all other tunnel complexes were built mainly for Air-Raid Precautions (ARP) use but could be used for manufacture or storage. Conflicting information exists as to the actual degree of manufacturing that took place underground.

Lord Austin and his senior directors interfaced with Central Government and especially the War Department officers at a high level. Did this result in the amount of underground areas constructed being far more than was necessary for manufacturing or air-raid protection, even taking into account the possibility of displaced manufacturing input? Did the Government have their own plans for using the tunnels, especially West B and East F areas which do not appear to have a clear purpose relative to Longbridge requirements? Would they have used the airfield which, whilst small, could land most single-engine aircraft? One wonders if there is any connection with the plan to move the War Department offices from London to Worcestershire on invasion by Germany from the south-east. The RAF would have gone to Worcester, the Navy to Malvern and the Army to Droitwich, all of which are only 45 minutes away. The Drakelow tunnel complex at Kinver, Staffordshire (five miles west of Stourbridge) which was built by Rover to manufacture aero engines but was never fully operational is also 45 minutes away. Research has not found any answers other than that Birmingham City Council appears to have been told by Central Government to ‘keep its nose out of affairs at Longbridge.’ This may have been to maintain a veil of secrecy over what was going on at Longbridge: it is surprising how little people knew of the underground areas. At the time, Birmingham City Council, along with many other large councils were in dispute with Central Government over what type of ARP shelters should be supplied for the population and who was to pay for what. In the end, plans for expensive deep large shelters were abandoned in favour of thousands of Anderson shelters that initially flooded until they were set in concrete

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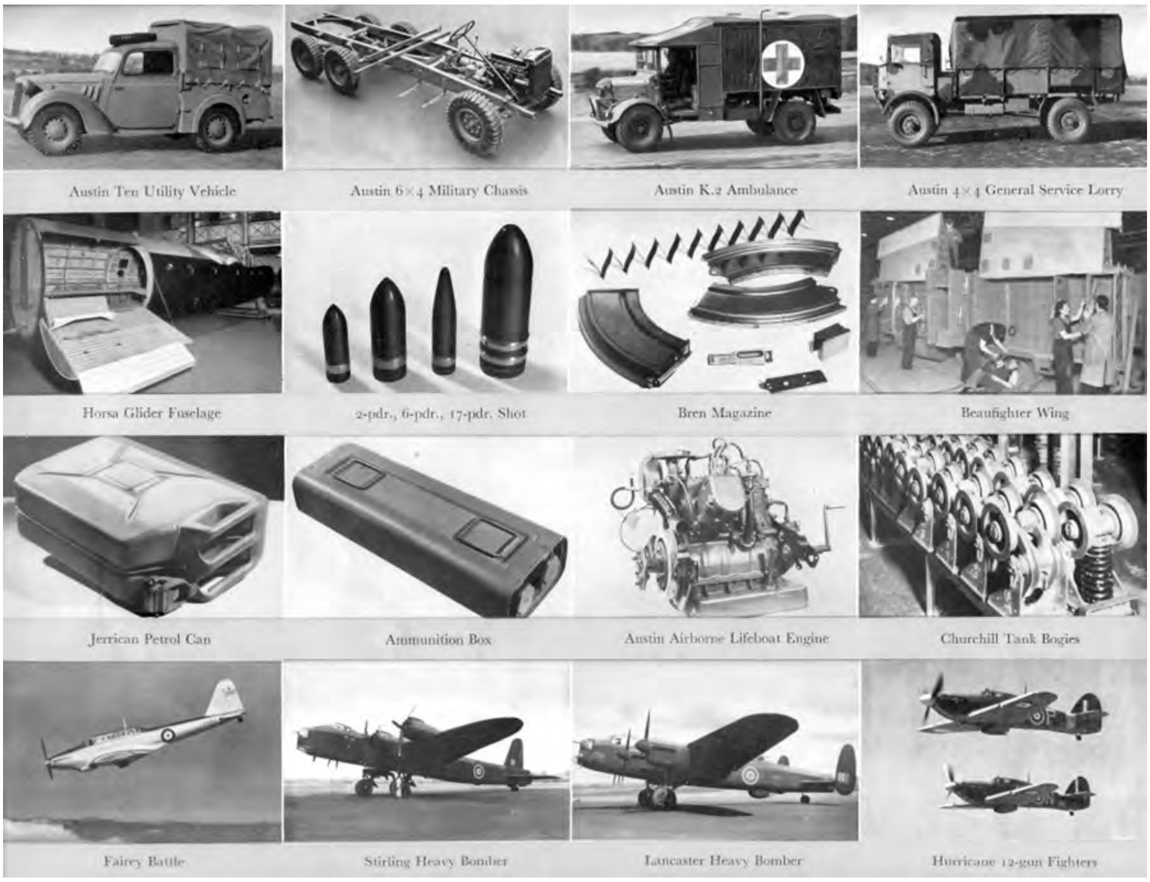
foundations; surface shelters were also constructed using brick and reinforced concrete.

Initially the factory had an air-raid siren to warn everyone into the shelters. This was extremely disruptive and valuable work time was lost. Some workers involved in noisy jobs did not always hear the siren. So a new system was rapidly installed based on a green light for ‘no raiders expected’, orange for ‘possibility of raiders’ and red for ‘imminent raiders’ in the area Some of these lights were still in place in the north toolroom in the late eighties. This proved to be an acceptable system but as time went by fewer and fewer workers left their jobs to go into the shelters unless the word spread that it was a big raid.



Items built at Longbridge in WWII

In the ends of the workshops on North and South Works, air-raid shelters were constructed of double brick walls and reinforced concrete roofs. It was almost possible to walk through these shelters to the main and safer tunnel shelters in Trentham Building (named after the construction company that built it), and under the Flying Ground. They also provided some cover if anyone wanted to shelter in an emergency, having not gone to the tunnels when the red warning showed. They were not very large and were more like passageways.

The Germans seem to have had a strategy for Birmingham of destroying the centre of the city. This area contained a lot of industry but not critical munitions manufacturing, except for certain isolated factories such as BSA and Dunlop. The unfortunate population suffered high mortality but manufacturing industry survived with only short interruptions; an unofficial figure of 5% loss of production through bombing may well be right. The critical munitions factories lying in the suburbs of Birmingham survived virtually intact, the Shadow Factories proving their worth. Did the Germans have a strategy of bombing the country into submission by attacking the main city centres but avoiding the aircraft production areas which could then be used by them to produce aircraft for their assault on Russia? Evidence is minimal and inconclusive mainly due to German strategies changing so much as the result of failure. Although one intriguing event that may be significant involved General Erhard Milch who was Chief Administrator of the Luftwaffe and its driving force, taking it from virtually nothing in 1933 to a potential World-conquering force in 1939. He was directly responsible for the building of aircraft factories and airfields and the manufacture of aircraft, a task he performed very effectively until Goering and Hitler began to make unsound policy decisions concerning the Luftwaffe administration. In 1937 the German government still hoped that Britain would be an ally when they started their intended invasion of other countries. During early 1937 visits by each other’s Airforce and War Department staff were made to view aircraft, airfields and factories; talks included the potential sale of British aircraft parts to Germany. In late 1937 General Milch led a high ranking Luftwaffe team on

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East Works Shadow Factory - Stirling Bombers

a tour of British RAF stations and some of the Midlands area Shadow Factories. He spent some time at the newly constructed Austin East Works Shadow Factory and viewed its production of Fairey Battle Aircraft. He also had meetings with Hugh Dowding and Arthur Harris, both high level RAF officers in the British War Department. Little did he foresee how important they would become and how much they would influence his future. Eventually the Nuremburg war criminal trials sentenced Milch to life; after serving 10 years he was released in 1955 and died in 1972. One can only ponder the possibility that Milch had plans for Longbridge other than its destruction by bombing.

Gradually the Longbridge tunnels took on more work but were never filled to their total capacity either for work, storage or air-raid protection; they fortunately were never subjected to German bombing.

A major social change occurred during World War II concerning women working in factories. Strict rules governed the relationship of male to female in the Austin workplace and in the air-raid shelters; and of course, officially, these rules were strictly adhered to throughout the war. The department that produced ammunition boxes and jerry-cans was predominately manned by local female labour. The introduction of the boxes for the Cadbury-made anti-aircraft rockets created a problem as they were heavy and difficult to manoeuvre around the spot welding machines. Production was slow and falling behind schedule, and to supplement the existing workforce a group of ladies from somewhere in London were temporarily employed until improved manufacturing facilities could be installed. These ladies were described as rough and ready, not frightened of hard work and had friendly, kind natures. They soon settled in at work and in their temporary pub and hotel accommodation. They provided a welcome boost to rocket box production and some ‘professional services’ to the local men-folk whether at work or during socialising hours. The air-raid tunnels and the term ‘tunnels of love’ took on a real meaning and when the ladies finally departed many a man had a wistful look on his face; at least two of these ladies eventually married locally.

During the Austin Allegro introduction in 1974 I worked with a material control foreman on material layout. One dinner-time we were passing the time with idle chat when he made the statement that he was thirty-four years old and had worked at Longbridge since 1940. This statement threw my brain into arithmetical confusion. Eventually I asked him if he had got the dates correct. He smiled and told me he was almost correct as he had been conceived at Longbridge in 1940 during one of the air-raids. He had actually joined Austin in 1955 as a shop boy. His father, already married, was a foreman and had adopted him; his mother was single but later married; all concerned knew the facts and were like an extended family, all friends. I am quite sure this was not an isolated incident as I did hear references to the ‘tunnels of love’ many times.

Fairy Battle - East Works 1939

World War II production was some 3,000 aircraft, consisting of Hurricanes, Battles, Stirlings and Lancasters, the last two having wings fitted at Elmdon airfield before being flown off; 120,000 vehicles, including the 8 hp utility, 4x4, 4x6 trucks and K2 ambulances (as in the film ‘Ice Cold in Alex’); 120,000 suspension and drive parts for Churchill tanks; 2.5 million ammunition boxes; half a million jerry cans; 2.5 million steel helmets; 1.25 million tank shells; four million gun magazines; and many parts and assemblies for other manufacturers’ products. The workforce peaked at 32,000.

During wartime the need for the rapid availability of new buildings was essential and one new building at the back of West Works, known as Partridge Building, was put up following the contour of the land, the whole building having a 2_ degree slope of floor and roof for its whole length. This saved the time and effort digging out the ground to give a level surface.

AFTER WORLD WAR II

After World War II the culture of protected areas continued, along with a set of rules concerning building heights, width between columns, sizes of doorways, use of sprinkler systems and fire alarms. The positioning of cloakrooms, mess areas, and toilets tended to be underground to double-up as air-raid shelters. The Government also paid a small sum each year to ensure that if war was declared they could rapidly convert the factory back to munitions production. Any installation had to be capable of removal in 48 hours, everything being bolted together in sections and nothing welded or set in concrete. I do not know how long the payment ran for; I think it probably finished in the mid fifties, but the basic rules have always applied. The Chinese, when stripping the plant out in 2005, obviously found the ease of removal very useful.

After the war Austin soon stopped the manufacture of most munitions. Even the supply of military vehicles rapidly declined, although the Ministry of Defence provided a number of projects for the truck designers and the prototype build area but few made it into production. The Austin Champ of the 1950s went into production but proved that design by committee tends to make for complication and compromise. One large order was for the Austin Gipsy 4x4 vehicle for the Auxiliary Fire Service. These were stored away for over 40 years without use; the last few came up for sale in 2005. Another large specific military order was for the Austin K9 one ton 4x4 which became the Army radio truck of the 1950-70 Cold War period.
The last special military contract was for six Austin FJ 4x4 trucks with multi-fuel engines in around 1968. It was not pursued by the MOD and so 70 years of munitions manufacture finally ended, although up to about 1985 many standard vehicles were supplied to all branches of the armed services, some in their service colours with insignia and fire extinguishers. I remember one strange order for 200 white mini-vans with no heater, passenger seat, spare wheel or wing mirrors; I often wonder what they were used for. One bright spark suggested they were wheeled skips, another suggested they were for underground use!

The Austin apprentices had a football pitch just off Longbridge Lane. It used to flood and get very wet so a decision was taken to plough drainage slots into the subsoil; this was carried out and the pitch returned to use, not without comments concerning the odd piece of glass seen on the grass. Eventually, after a number of glass cuts, the pitch was abandoned. Enquiries found that the site had been used to dump tons of glass taken out of the roof lights just before World War II. A liberal three inch coating of sand from the new Number Two Paint site cured the problem and football was reinstated following reseeding.

After World War II, as far as I have been able to ascertain, no part of any underground area at Longbridge has been used by any person connected in any way with any government department, military or civil, other than for fire brigade training. This is contrary to some people's belief based on their incomplete research and misunderstanding of certain facts connected with the United Kingdom Warning and Monitoring Organisation (UKWMO) disbanded in 1992. The large siren on the end of Trentham, removed in 1992, was part of the UKWMO civil population warning system in case of nuclear attack by the Soviet Union. This would have been activated by the UKWMO organisation using the British Telecom phone network. Firstly UKWMO would send a message to main police stations via the Handel system that used the speaking clock time distribution system. This was a secure network and was continually scanned for faults which individually did not affect the system. The main police stations would then continue the warning via their Handel system carrier control point equipment (a 72 kHz carrier modulated with speech or tone signals). The tone signals would activate the BT WB1400 receiver located next to the electrical control gear for the siren. The WB1400 would activate the siren control gear and the siren would run. The siren was not activated by people located at Longbridge. The current population warning system is called audio visual interrogation. You ask the person next to you 'what was that bright flash and loud bang?' This is just before you are vapourised into oblivion!

THE COFTON RAILWAY TUNNEL

One hazard of working at the Austin works was a seemingly in-built tendency of people to pull your leg or wind you up in an extremely subtle manner. The great danger was that logic would determine how you reacted to something somebody said and you would completely get the wrong end of the stick, much to the delight of the perpetrator. At times it was like doing a crossword with the clues in Chinese whilst reciting the 17 times table. One that puzzled me for many years was the statement 'there was an underground railway at Longbridge'. The person would not discuss it or elaborate. Eventually I lost contact with him but I had a feeling that an element of truth lay somewhere. In a chance conversation with someone many years later, he mentioned that the main line railway (built 1838 – 41) that runs alongside the Austin works once ran in a long tunnel, the former Cofton tunnel. When the double track line was widened to four lines in 1925 – 29, the double-track tunnel was opened out to a cutting. During this widening, part of the 435 yard tunnel collapsed on 11th May 1928, killing several workmen. Hence the exact words 'there was an underground railway at Longbridge' were quite correct.

PART B – SPECIFIC SITES

WEST WORKS COMPLEX No. 1 - AREA A ON MAP

Two tunnel complexes were completed at the rear of West Works. No. 1 complex had two main entrances and an escape / air vent. On top of this was an aircraft spotting and position-reporting point that worked in conjunction with similar points on the nearby Lickey Hills and Frankley Beeches. The main entrances were some

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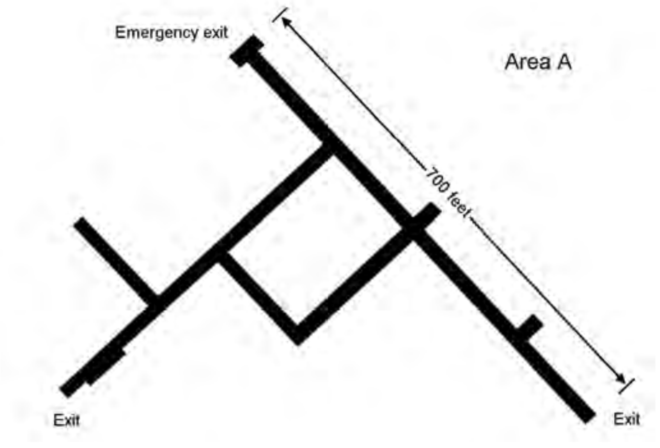


700 feet apart at right angles to each other in two small valleys, not very obvious to a passing person or aircraft. The area was known from around 1880 as ‘the Sandpit’ having provided much sand for local house building.

My introduction to the No. 1 complex was during my apprenticeship around 1966 when I was told we had to take a painted body to the ‘Chamber of Horrors’ for corrosion testing. When we arrived, the main entrance had a large grilled doorway. After about 40 feet the tunnel contained an area with steam leaking from the pipes and water troughs; it was quite hot and extremely damp. On turning a large valve, the steam stopped and revealed vehicle body shells dripping with rusty water and stalactites 6 inches long hanging from the tunnel steelwork. We moved the car bodies out and put the new one in. The technician I was with then took me on a short tour of the tunnels, which I found fascinating. Later that week I ventured back with a torch and piece of chalk, so I did not get lost. The complex consisted of cross tunnels that linked with the other entrance tunnel; also some dead ends varying from 20 feet to 60 feet long. The floor was stacked with all sorts of jigs, fittings, conveyor parts and lots of wooden patterns for castings or steel body panels. It was mostly dry except where the steam caused much condensation. It appeared to be on one level and between 100 feet to 60 feet below the hill above. One somewhat frightening aspect of working in the test area was the lighting. I was told to switch the lighting on from the main board at the entrance then wait ten minutes before entering. Quite often a light unit would explode and sometimes all the electrics would go off; we would then have to leave the steam off for the electricians to go in and make repairs. I think the term ‘Chamber of Horrors’ was an apt name for the area.

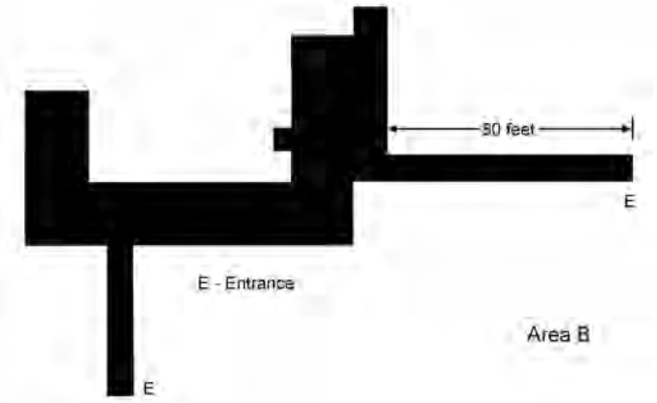
All air-raid shelter tunnels had service rooms built into the sides: these provided a control point, electrical switch points, ventilation plant, toilets and first aid post.

The North Works manufactured the Hispano-Suiza 20mm cannon. On completion they were taken to West Works Complex No 1. Near the entrances to Complex No.1 was a test rig and firing range to test the guns and set them up accurately. The whole area was heavily restricted due to the safety aspect of the firing, and the secrecy of the tunnels.

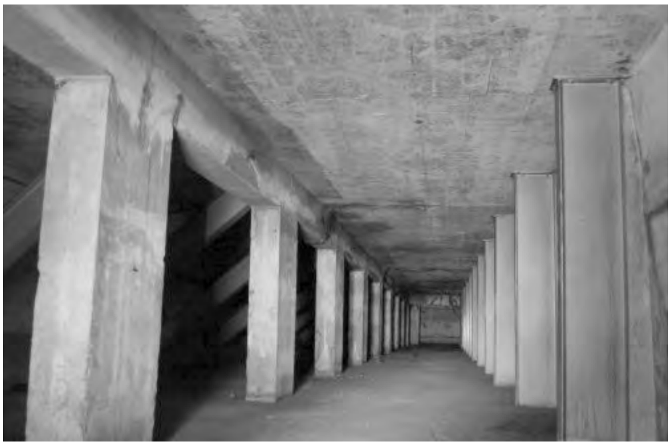
The hill above had a small area for rubbish burning. I remember that following Lord Stokes’ 1968 review of projected new model prototypes in wood, clay and fully engineered vehicles, a decision was made for political reasons to burn and crush all Longbridge prototype models and plans. The fires burnt for over a week. On reflection, the dying embers were an indication of the future.

In 1977 work began on the new Metro body-build factory of 17.5 acres. The hill and tunnels of Complex No. 1 were to disappear. It was strange seeing the tunnels uncovered almost like some strange subterranean animal. The excavators soon reduced them to scrap metal.

WEST WORKS COMPLEX No. 2 - AREA B ON MAP



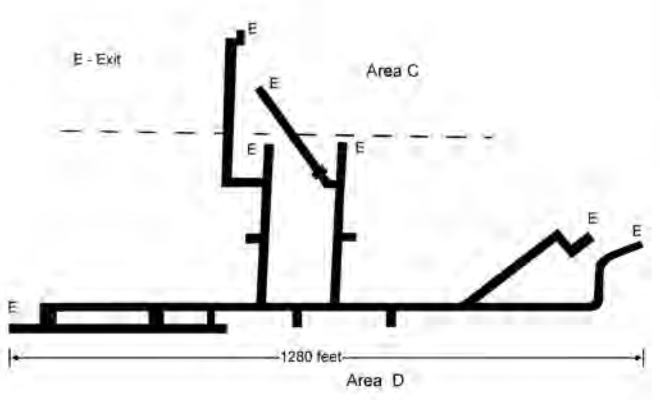
This was not far from Complex No. 1, but at a higher level and smaller in overall length. The entrance tunnel was eight feet square and ran for about 50 feet. At a T junction it met a 100 feet by 20 feet tunnel, at one end of which was another tunnel running at right angles for



West Works No.2 - Showing reinforcement

30 feet being 20 feet wide; at the other end running at right-angles was a 30 feet by 20 feet tunnel. Leading from this tunnel at right angles and away from the complex was an eight feet square foot tunnel running for 80 feet, this may have been an alternative entrance / exit but was blocked as long as I can remember. Its main intended use seemed to be only as an air-raid shelter, but it could have been used for manufacturing, medical requirements or as a headquarters or control centre. No records or recollections of this area exist; probably it was held in reserve and not really used. It was quite dry and for some reason was always kept very secure, mainly to stop dumping. In the late seventies it was reduced in size by about a third and then in something of a panic partly reinforced with heavy steel girders and concrete, probably to stabilise the hill it went into. One rumour, although highly unlikely, was that it was used in the fifties to store gold bullion as a hedge against inflation; it was more likely to have been confidential company records.

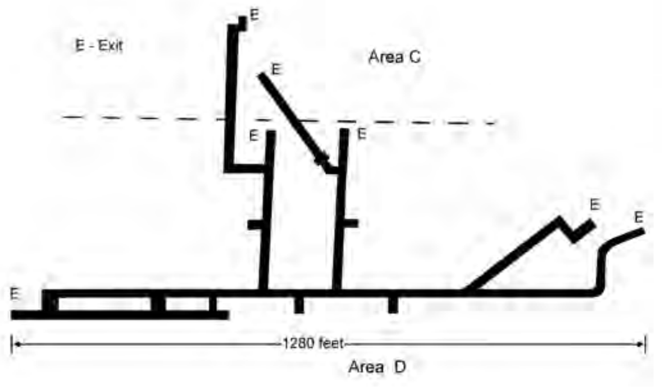
TRENTHAM BUILDING TUNNELS - AREA C ON MAP



The tunnel complex that ran under the Trentham Building was unique in that it was the only one to run under a factory. It was also quite close to the factory floor level. Again toilets and cloakrooms doubled as air-raid shelters with tunnels leading off. These two tunnels joined with the flying ground hill tunnel complex, providing escape routes from either complex. After World War II they were used for storage, and one tunnel that was quite large had old car parts in it that provided many spares for the Austin car collection. As you entered the approach to one tunnel entrance before the cloakrooms there was a large medical centre and opposite was the main control centre for all the conveyor systems in the area feeding the bodies from West Works into the paint shops. There were believed be about 16 miles of conveyors. The tunnels were also used to carry high tension power cables, communications trunking and high and low pressure steam pipes. One tunnel had a column in the middle of it due to a builder's error. The builder's question, 'What tunnels?' springs to mind.

On top of the southern end of the Trentham Building was a huge siren about three feet six inches long with double ended two-foot diameter sirens. It was actuated by a telephone line connection and every year it was tested but never allowed to reach full speed, much to my disgust. A discussion with one of the maintenance managers hatched a scheme to bypass the controls and let it run up to full speed but we chickened out at the last minute as we could see it might create a touch of mass hysteria or the workers downing tools. The activation gear was replaced around 1976. In 1992 the siren was craned off the building never to be replaced. One person said it was the biggest siren made and could be heard five to ten miles away.

SOUTH WORKS FLYING GROUND TUNNELS - AREA D ON MAP



On the Flying Ground side of Trentham was an extensive tunnel complex having five entrances and two tunnels linking into the Trentham complex. The main tunnels were cross linked and had some short dead ends. On exploring I established that three of these dead ends had good potential for carrying on and linking in with the East Works complex.

They all had bricked-up ends, one of which had some gaps at the edge. With the aid of mirrors and a torch it could be seen to go only about another two feet. The next was well bricked-up and it took some time to remove a brick, but it only went two feet. The third was again well bricked-up and, having removed a brick with difficulty, another row of bricks was there. Finally, after spending a shutdown week with hammer and chisel and removing three layers of brick it only went about thirty feet further with no steel supports. Why it was triple bricked up I cannot imagine.

Just inside one entrance was an area about 30 feet x 30 feet; this was taken over by the Wages Department during World War II. The wage packets were made up and the foremen collected them in wooden cases for distribution to the employees; works police permanently guarded this area. In the area is a large strong-room that was used for the wages and company records, now empty and open.

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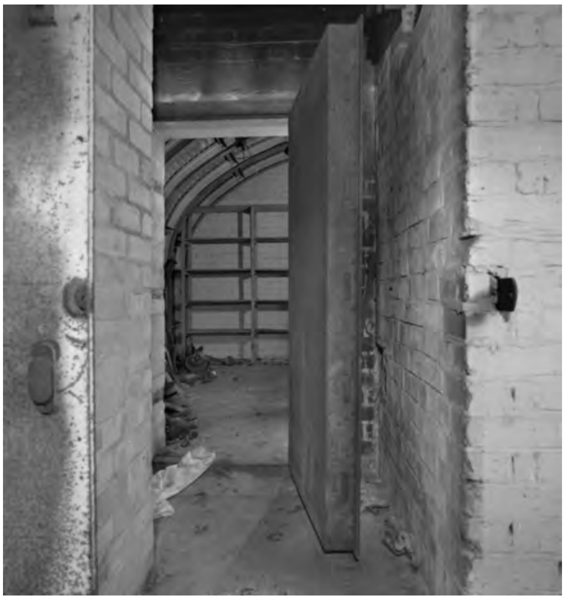
Large Tunnel Area C

During World War II these tunnels were used for storage of machined parts for aircraft, engines, vehicles, guns and many other munitions components; their main use was providing air-raid shelter for the adjacent factory buildings. Post war they were used for storage for prototype bodies, whole vehicles, motor show plinth engines and suspensions etc, various jigs, fixtures, machine tools, and sewing machines.

On Friday 27th October 1978 a fire occurred in the complex. The alarm was raised at 16.00 by the people in the car designs block (above two tunnels) who could smell burning. The works fire brigade investigated and pinpointed the tunnels as being the source. Further progress into the tunnels was prevented by increasing amounts of smoke and heat. At 16.41 the West Midlands Fire Service was requested, and despatched two pumps and a hydraulic platform, standard callout for Longbridge. On arrival breathing-apparatus (BA) equipped firemen entered the tunnel complex only to be beaten back by the intense heat. After a number of attempts resulting in blistered helmets, all BA men were withdrawn. By now ten pumps were on site and Longbridge management were asking awkward questions like 'well how are you going to put this fire out?' It was decided to seal the tunnels off and starve the fire of oxygen, which everyone thought was a good idea, but not so easy to achieve. At 17.32 a request for three large high expansion foam units was made. By now the basement of the car design block was showing signs of warming up, with fumes and smell very evident. The brighter element from the works engineers put forward the theory that the heat had set fire to the ground in the area as it was likely to be rubbish, ash and coke.

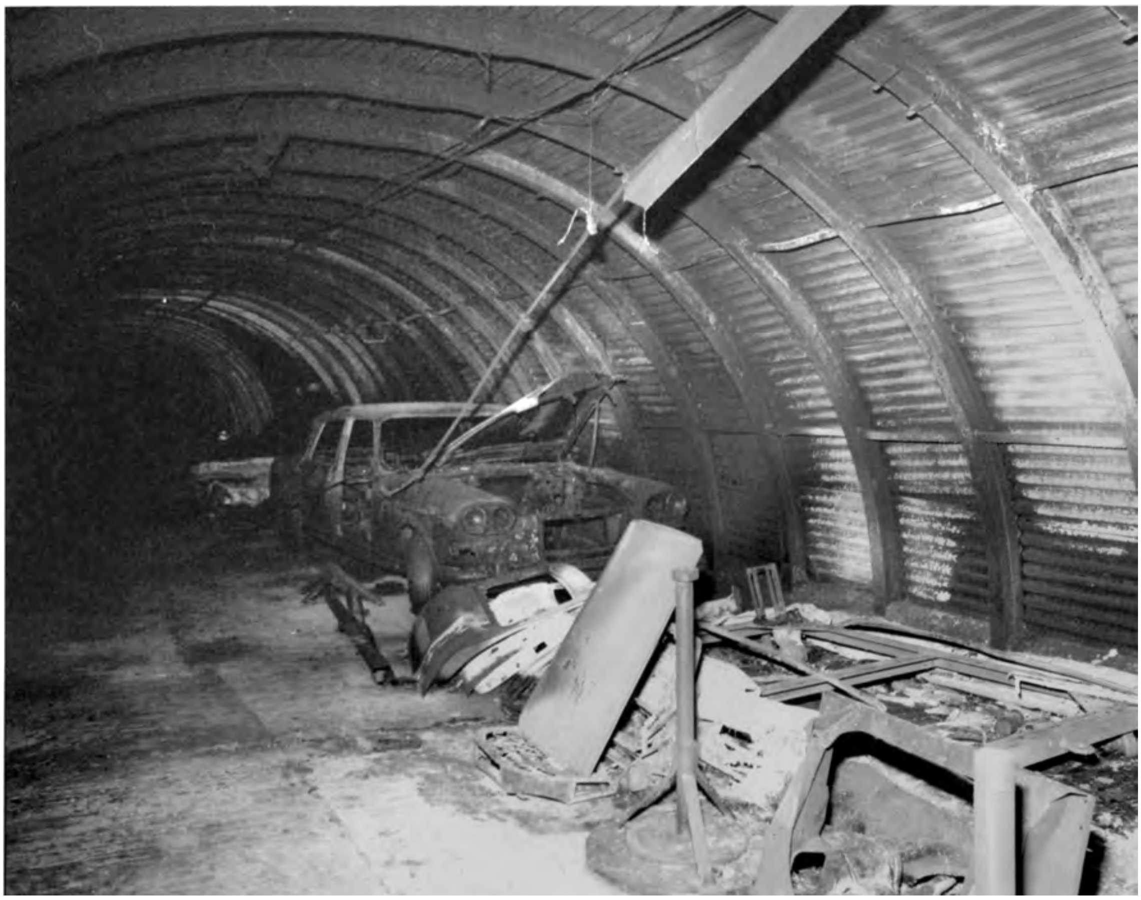
The foam machines arrived and were sealed against the tunnel entrances. After about an hour of pumping foam at 19.30 a slight reduction in smoke was seen. A leakage of foam managed to find its way onto the main Birmingham to Worcester rail line halting trains for an hour until it could be hosed away. As the smoke reduced further, a quick inspection revealed a roaring inferno that was impossible to get close to. A decision was made to start approaching the fire from other tunnel entrances and slowly work towards the heart of the fire. A BA team took a jet and started into the tunnels but due to the intense heat they could only stay for ten minutes at a time.

An additional four crews were sent for, and at 22.30 the shift was changed; fresh men added two more jets but progress was still slow with some men suffering extreme heat stress and requiring hospital treatment. Progress came to a stop at a roof fall where the heat was very intense; to cope with this two ground monitors were placed in the tunnel. Eventually the heat lessened and a safe way round the roof fall was negotiated. Large amounts of steam had been generated which made it very uncomfortable for the firemen; eventually the foam generation was stopped. Props were used to support the sagging roof in the area of the heart of the fire.

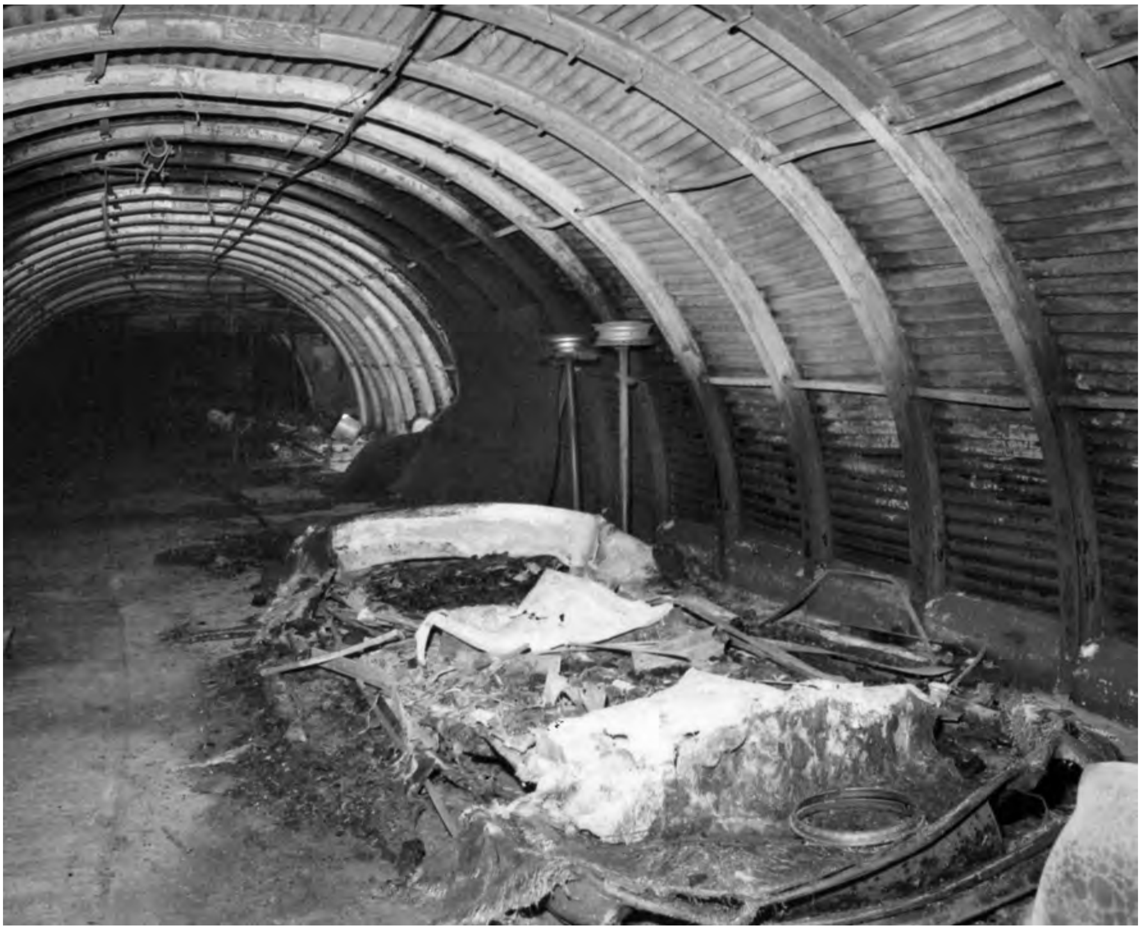


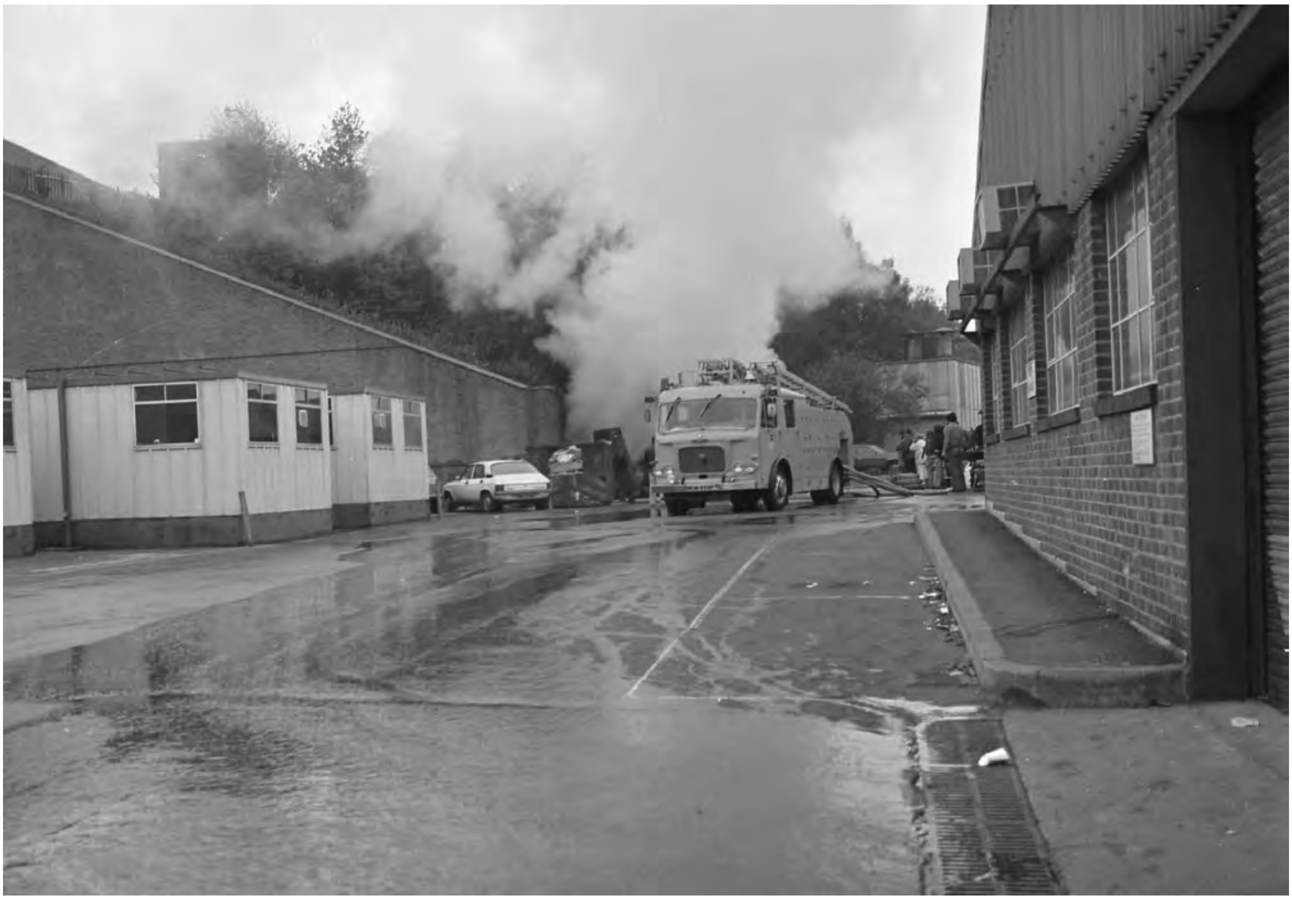
Strongroom Door Area D

Cooling of this area proved to be difficult and it was assumed that the ground had in fact ignited. A second BA team was now working towards the first team using three jets, at 08.00 on the Saturday they met, at 09.10 'fire stop' was notified. Three jets and six BA men continued for a number of hours cooling hot spots.

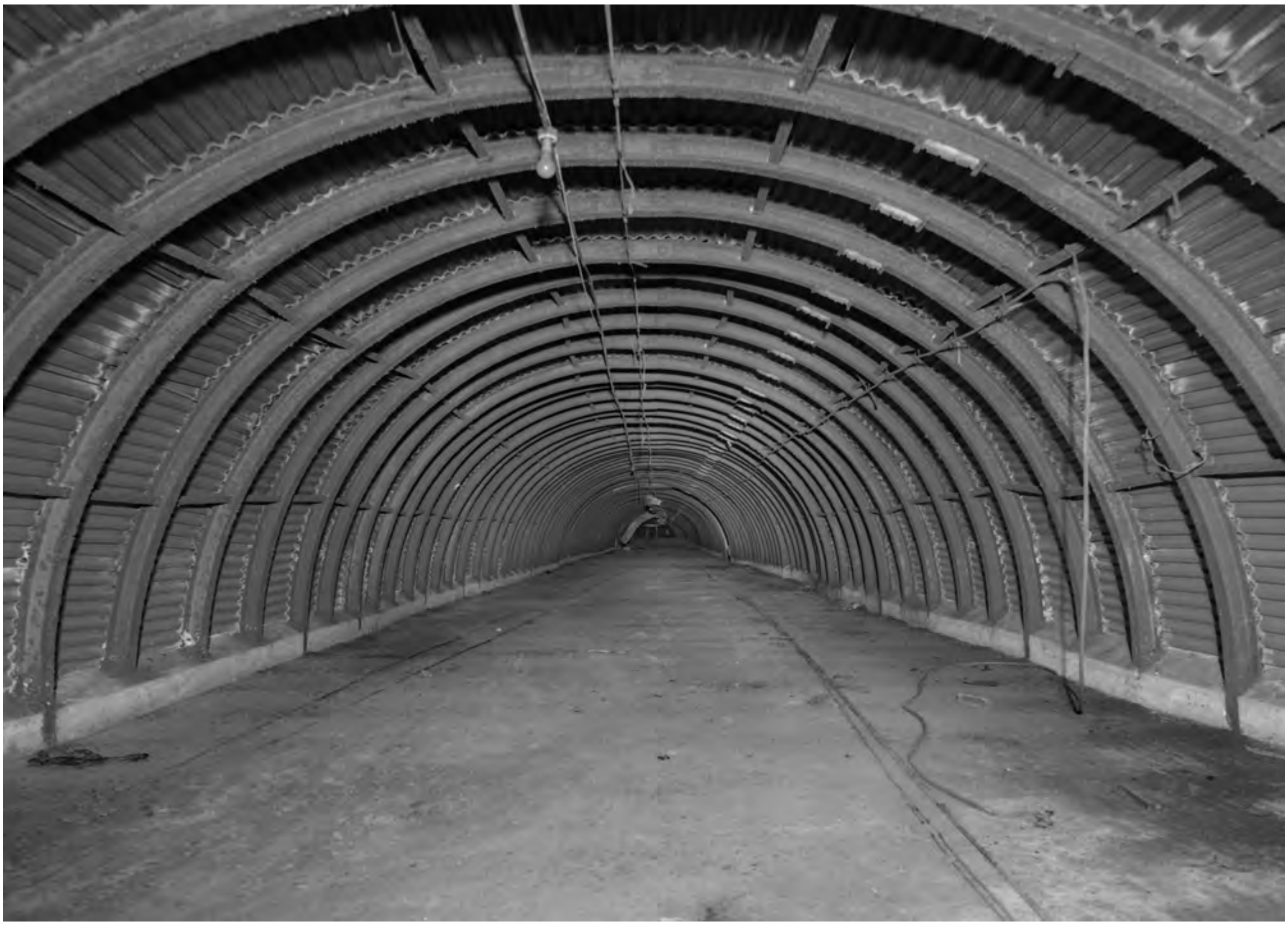


Above & Below: South Works Flying Ground Tunnels showing Fire Damage

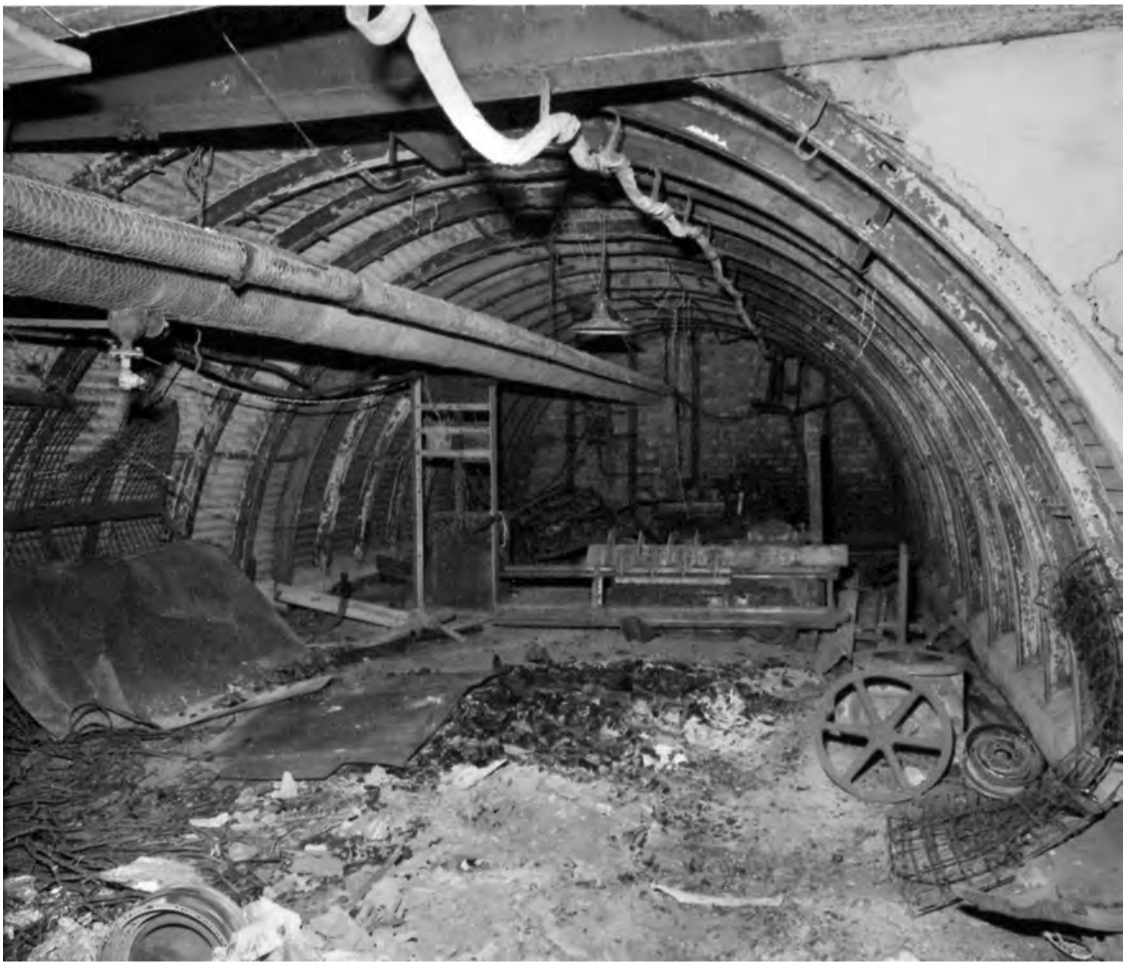




Above: South Works Flying Ground Tunnels during the fire. Below: South Works Flying Ground Tunnels.



The Austin-Longbridge Underground & Its Culture



Major salvage, stripping and cooling continued through Saturday and Sunday, aided by large cooling fans, and the next four days were spent in working with contractors in securing the basic safety of the fire damaged area. On Thursday November the 2nd at 20.20 the incident was handed back to the works fire brigade.

Detailed inspection revealed that severe damage had occurred to the tunnel lining and steelwork; voids were also present behind the lining. In the tunnel that the fire occurred in most things in storage had been reduced to scrap, complete vehicles were just twisted metal, prototype bodies and work bucks just piles of ash. Very quickly a contractor came in and cleared up, including a large river of solidified aluminium. New tunnel lining and steelwork was fitted and the void behind the lining was grouted with pumped concrete. A resultant report declared the car design block above the tunnels unaffected and the tunnels ready for use. The insurance company having ‘forked out a big bucket of money’ for the repairs restricted what could be stored in the tunnels and demanded improved security and greater restrictions on access.

During the late sixties the tunnels were used to store surplus engine pallets, also the Mini Cooper S was in production and sometimes suffered from ‘evaporation’ - that is, number produced 500; number passed to sales 499. This was due to their popularity and a keen market for spares. On removing a batch of pallets a Cooper S bodyshell was found stacked on its rear end against the tunnel wall hidden by the pallets. It had been stripped of all parts down to its bare body shell, the body number indicated it had been made six months beforehand; an on-site contractor came under suspicion but nothing was ever proved.

In 1986 we used part of the tunnels to store paint shop technical records and equipment. One of my technicians reported to me that he had smelt bacon cooking when he had moved some equipment into the tunnel on a Sunday morning. Initial inspection revealed no sign of anything suspicious but the technician was adamant that someone was using the tunnel, so we did a more thorough search and found by getting into a pallet and then out of the hidden side you gained access to one of the service alcoves in the side of the tunnel. Someone had fitted out the alcove with a bed and a chair made from car seats and had even tapped into the electricity for his personal lighting; he also had a small cooker and some tinned food. Other evidence indicated he had been in occupation for about three months. Works police were notified and decided to monitor the tunnel in an attempt to catch the rent-free occupier. They never did, the tunnel was cleaned up and all locks changed. I think one can say that even after nearly 50 years the tunnels were still giving shelter to humans.

If you approach Longbridge on the A38 Birmingham to Worcester road the highest building on the site to your left is the Car Assembly Building Number 1 Painted Body Store. During the construction of this building the 36-inch bored piles were placed precisely in position so that they straddled the tunnels and carried on past them. Laser positioning of piles and tunnels was carried out to ensure no mistakes.

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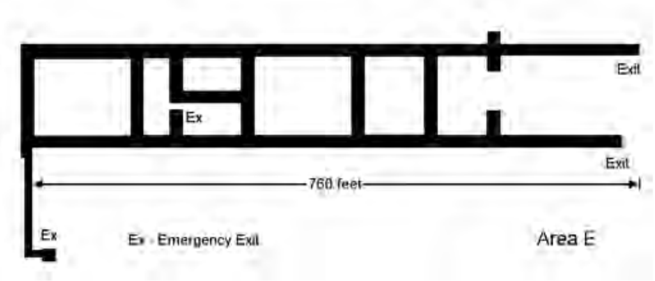
When BMW was working on the introduction of the new Mini they decided to build another painted body store right on the edge of the old flying ground right above the tunnel complex. They decided that they wanted a close piled concrete pad to build the Meccano type structure on. This meant the tunnels would have to be filled in. The concrete was pumped in from an on-site plant for about nine weeks. Thus part of this tunnel complex is now solid concrete. Having virtually completed the body store BMW walked away from Longbridge, but not without taking down their body store and shipping it to the Mini project at Cowley. In exchange they gave Longbridge the Rover 75 and paid for its transfer to Longbridge. An action that turned out to be totally futile in the long term.

EAST WORKS – AREA E ON MAP



This was the largest Shadow Factory built at Longbridge (demolished 2007) and was conventional in design other than the main support columns which were very widely spaced to accommodate winged aircraft. The aircraft construction started at one end, gradually progressing along the factory until completed. They then went up a ramp, crossed Groveley Lane into the Flight Shed for final testing before going up a cable operated ramp or lift to the flying ground for the their maiden flights. The larger aircraft went as fuselages to Birmingham (Elmdon) airport for final assembly and to undertake their maiden flights. The largest aircraft to take off from the airfield was a Beaufighter. This aircraft made an emergency landing, was repaired, and then for take-off stripped of as much weight as possible. It just made it into the air. The flight shed is quite an unusual building having an immense single span lamellar construction roof made from pressed steel sections (similar to a motorway crash barrier) assembled to form a self supporting honeycomb lattice with horizontal tension rods with bottle screw adjustment. It could be the only remaining example of this type of roof, which is of a superbly aesthetically pleasing design, which is believed to be German. The Flight Shed also repaired and serviced Hurricanes and Spitfires, which were brought in by road or flown in, often by female ferry pilots.

Leading from the East Works, two large main tunnels form what was known as the underground factory complex (area E on the map). They are joined by a number of cross tunnels with service chambers running off them for heating, electricity, toilets and ventilation. The tunnels ran under the flying ground and had one air shaft and one small emergency escape tunnel which also carried services.

The complex produced mainly the Mercury and Pegasus radial aero engine along with a few others. The engines were assembled on trolleys running on rails. As they were completed they left the tunnels to go to the test cells, the strange concrete blockhouses next to the railway line and Groveley Lane. Here aero engines went onto a test rig where an electric motor drove the engine. The timing, compression, oil pressure and oil quality were checked. If satisfactory, the engine went for power testing where it was run on fuel with a short propeller to ensure air flow for the air-cooled engine.

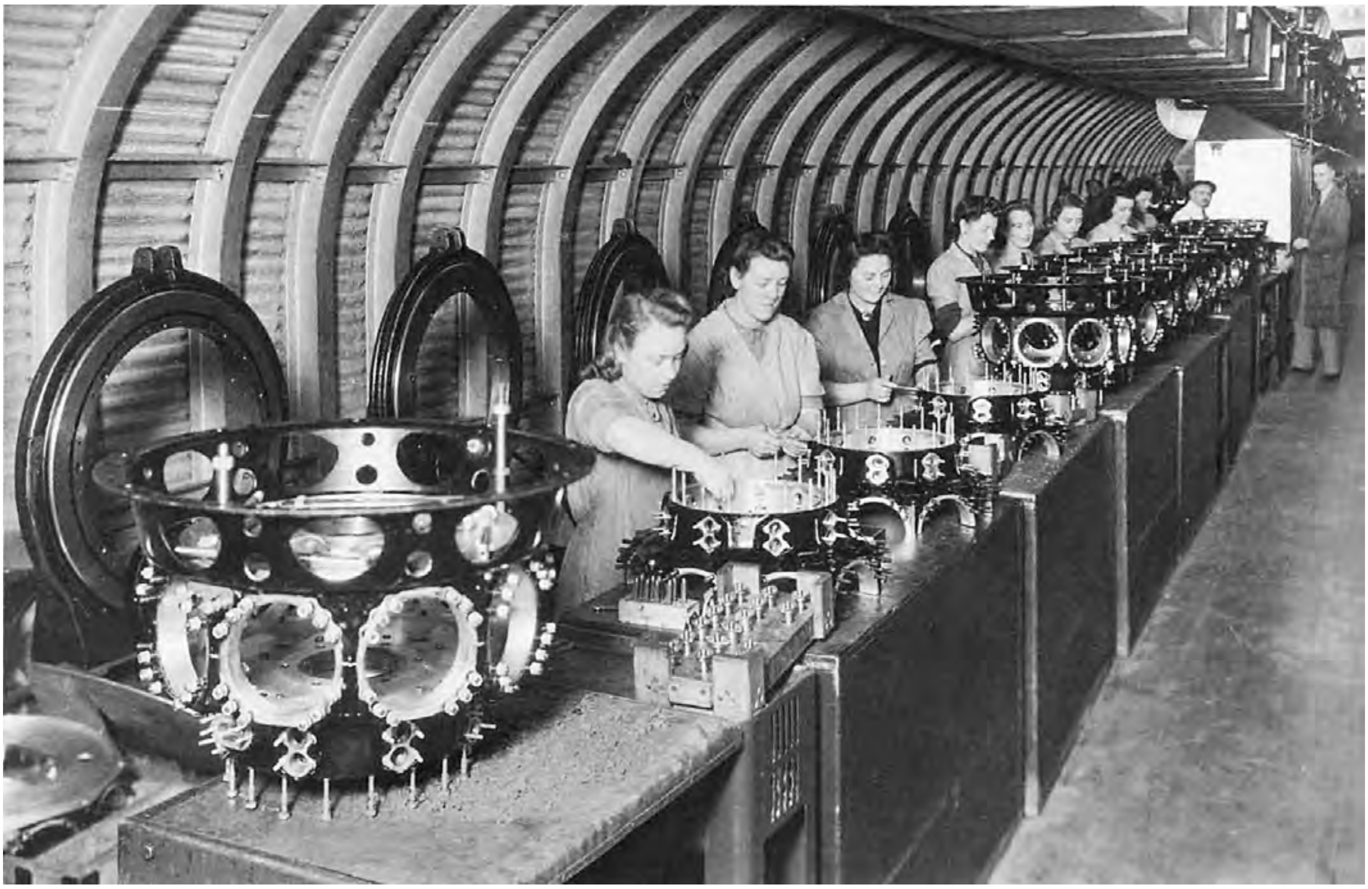
In later years these test cells had a roof put on them and were used for engine development. One interesting engine was the Austin 250 gas turbine designed by a team led by Dr Weaving, which was a commercially sold engine mainly for generating and pumping. It was of simple design but well known for its very robust construction and lack of maintenance requirements. Many were used for oil and gas pipeline pumping; some are believed to be still running. Whilst the plans for this complex showed no tunnels linking to the complex on the other side of the flying ground, rumours said there were. I never found a link and doubt if one ever existed.

Stirling bomber parked above East Works tunnels

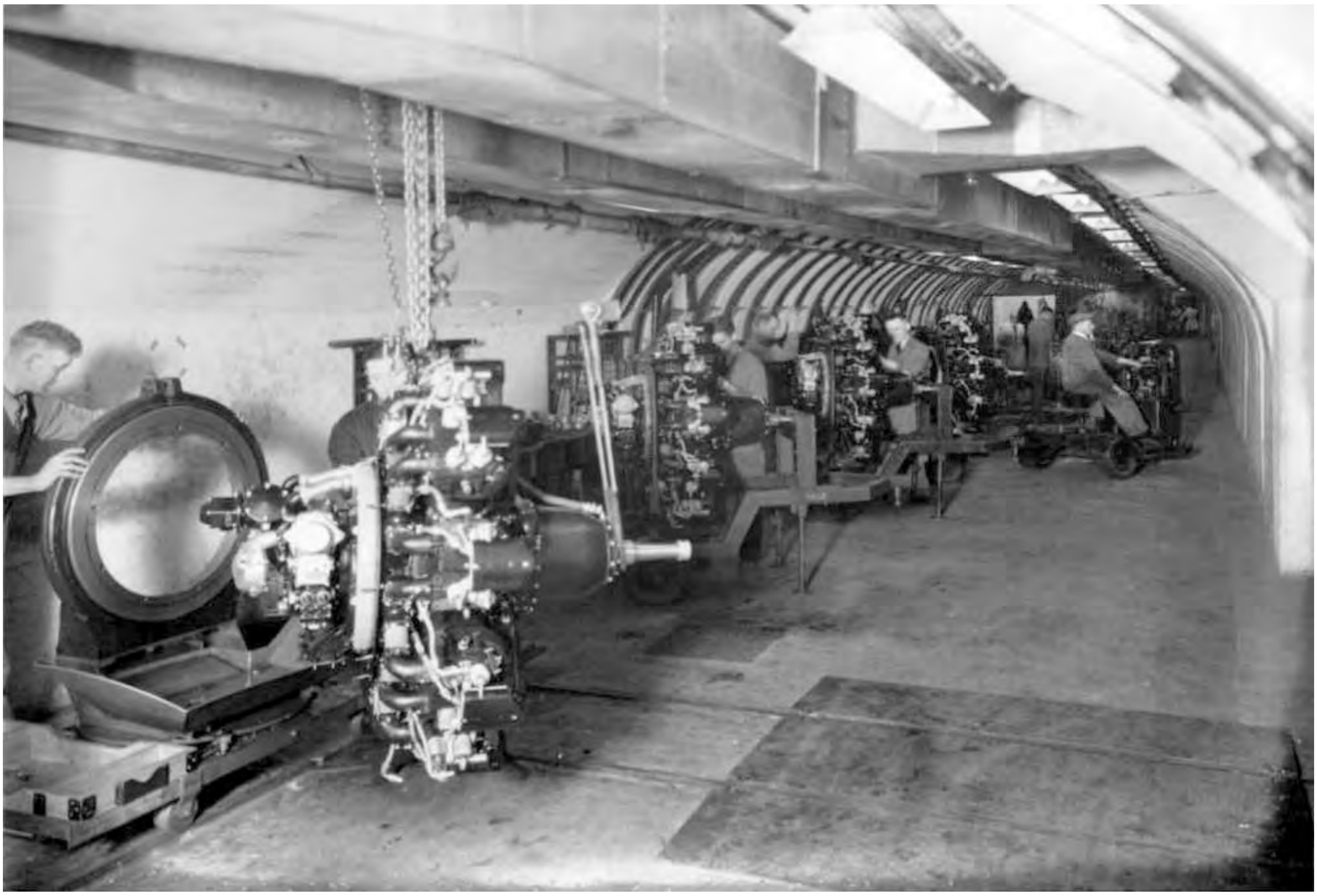
Toilets, cloakrooms and mess areas were not protected in East Works. Some small local air raid shelters existed but the underground factory was the recognised shelter for the Flight Shed and northern end of the main Shadow Factory.

Around 1967 a plan was developed to extend the tunnels to the Car Assembly Buildings to allow East Works built ‘A’ series engines to be supplied by conveyor instead of road. The scheme was a bit grandiose and the economics not very sound, so it was abandoned. During a period of two to three days in the eighties the underground factory tunnels were used to move vital supplies out of the East Works factory whilst the gates were picketed by strikers.

The Austin-Longbridge Underground & Its Culture



Above: Aero engine assembly in East Works Tunnels. Below: Completed Engines in East Works Tunnels



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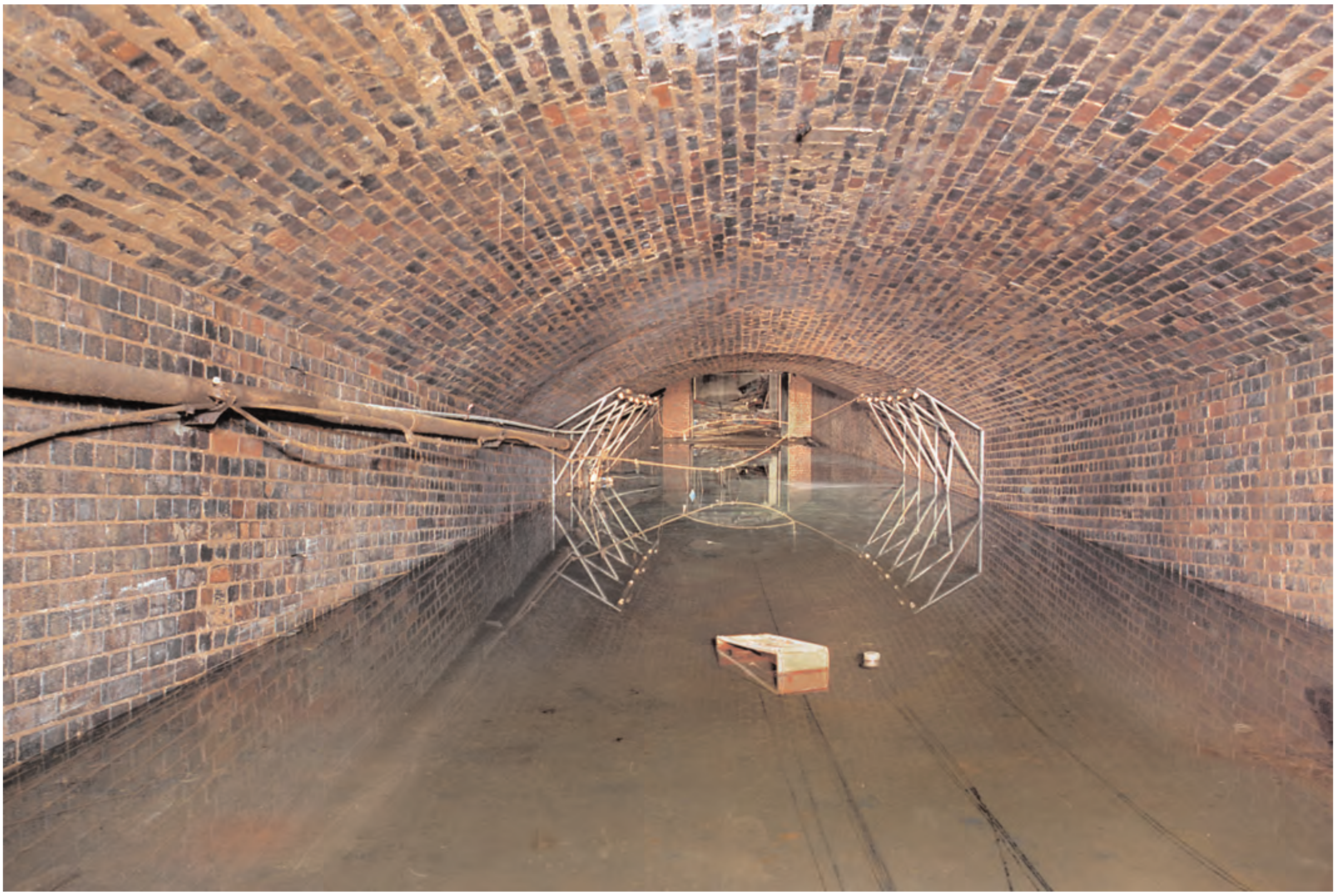
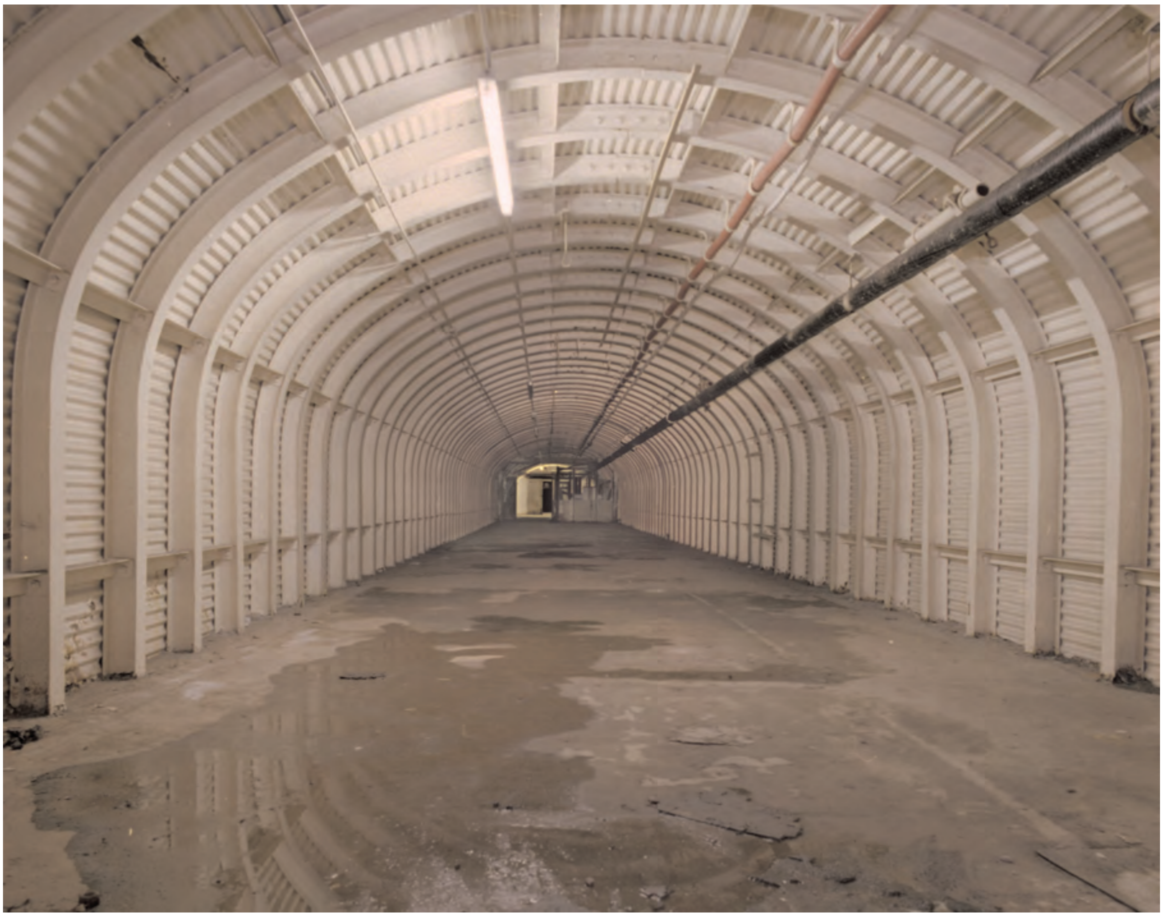
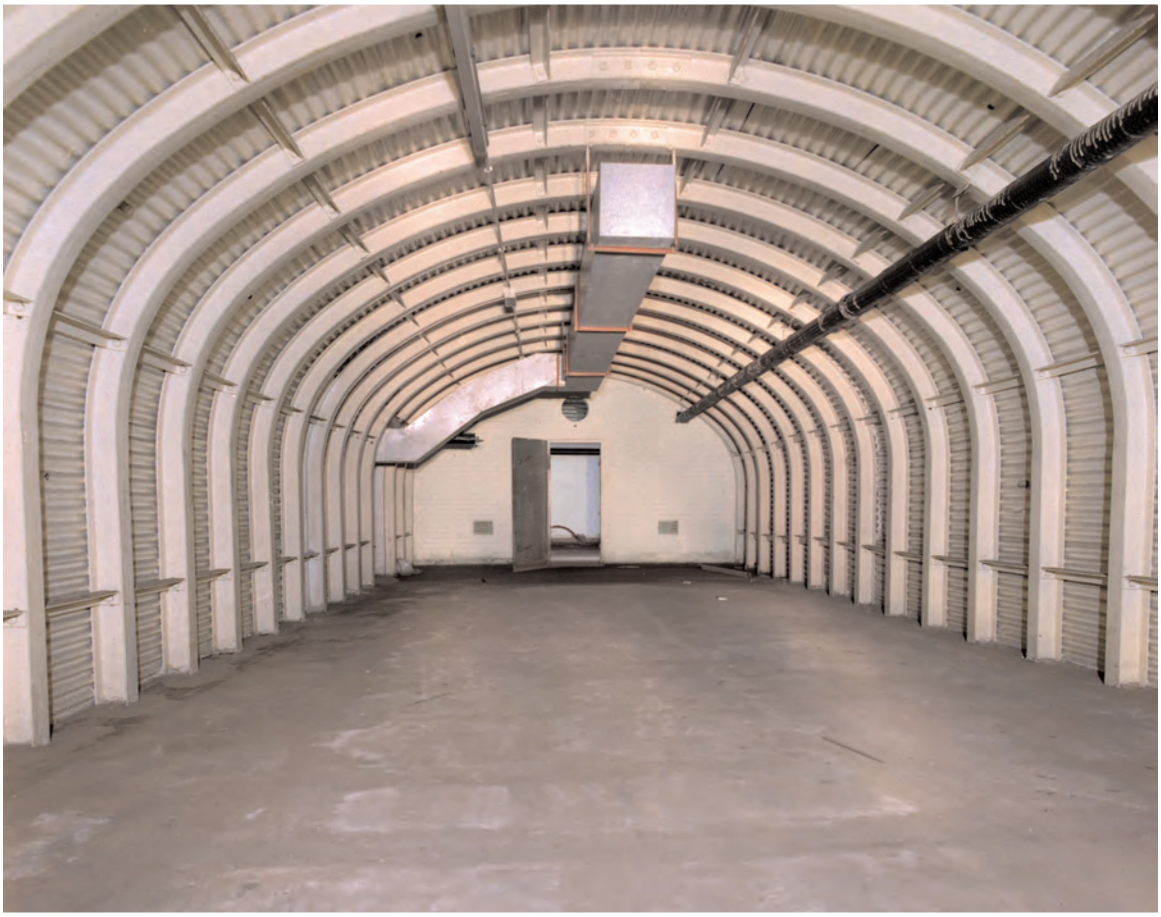


Tunnels at Longbridge - Photos by Nick Catford

Photo Feature



Tunnels at Longbridge - Photos by Nick Catford



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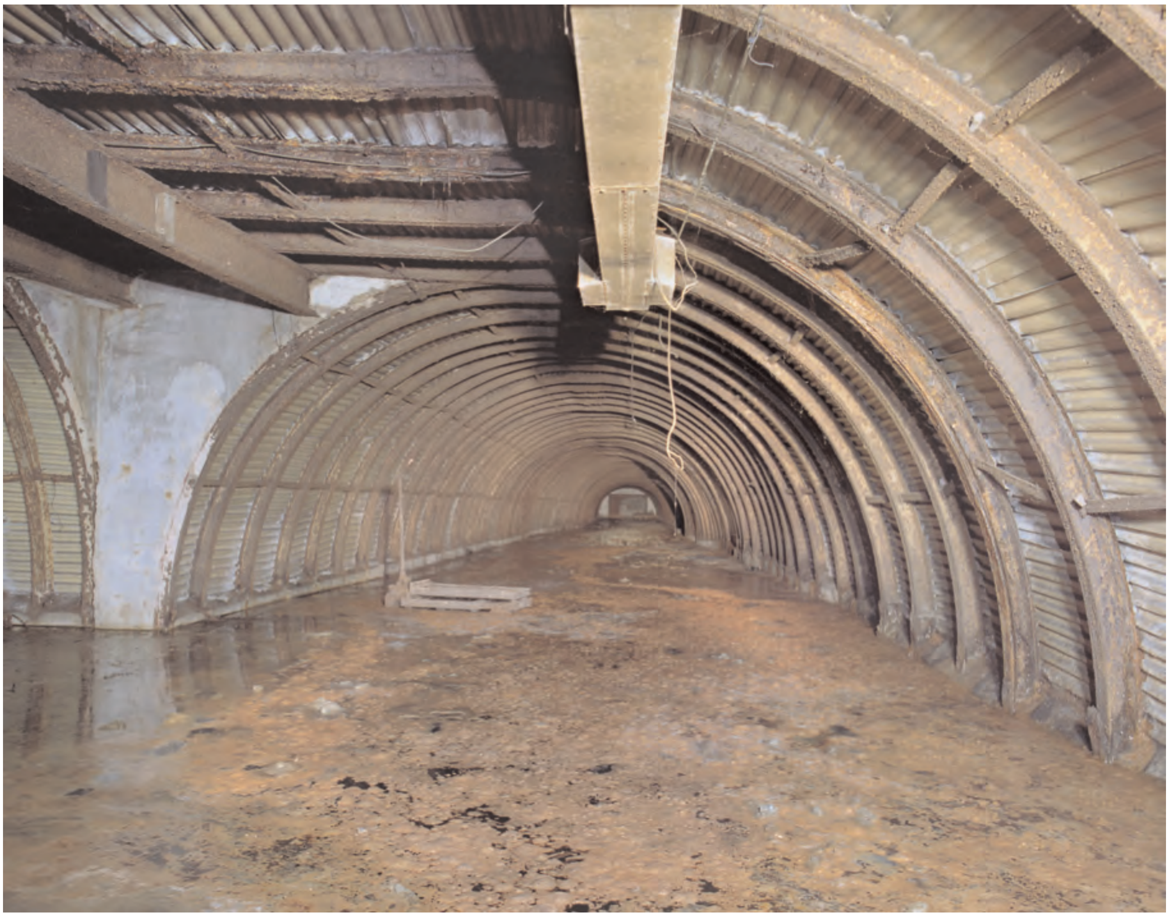
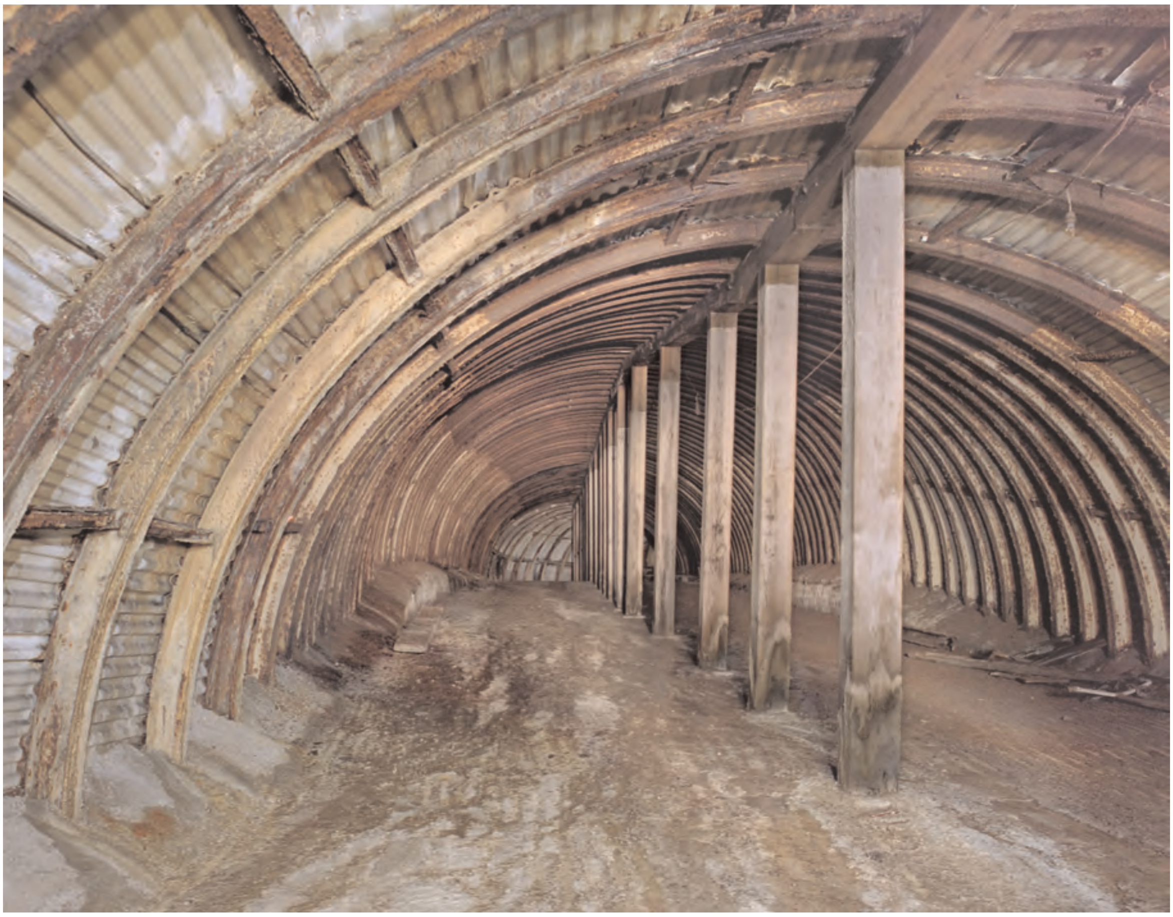


Tunnels at Longbridge - Photos by Nick Catford



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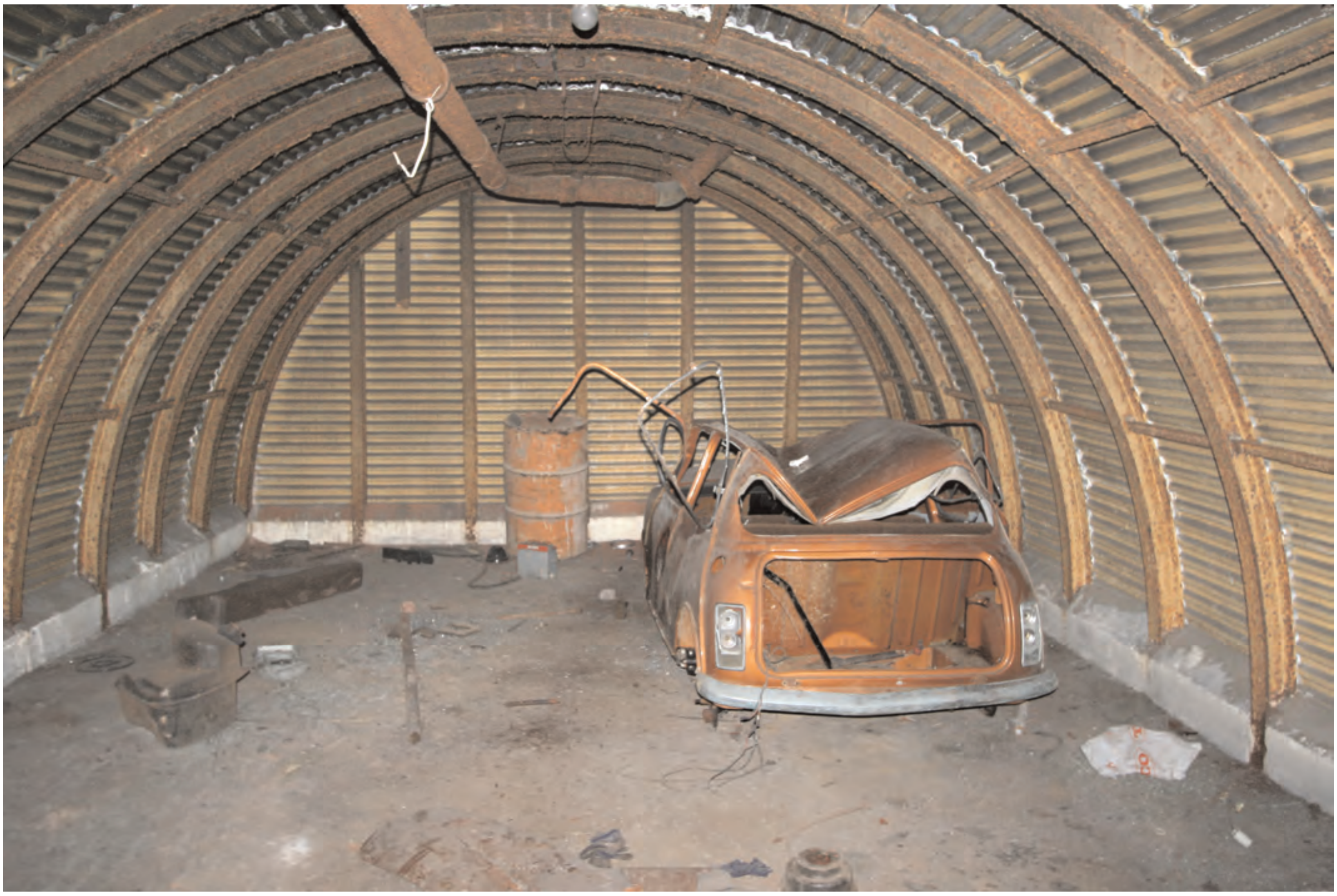
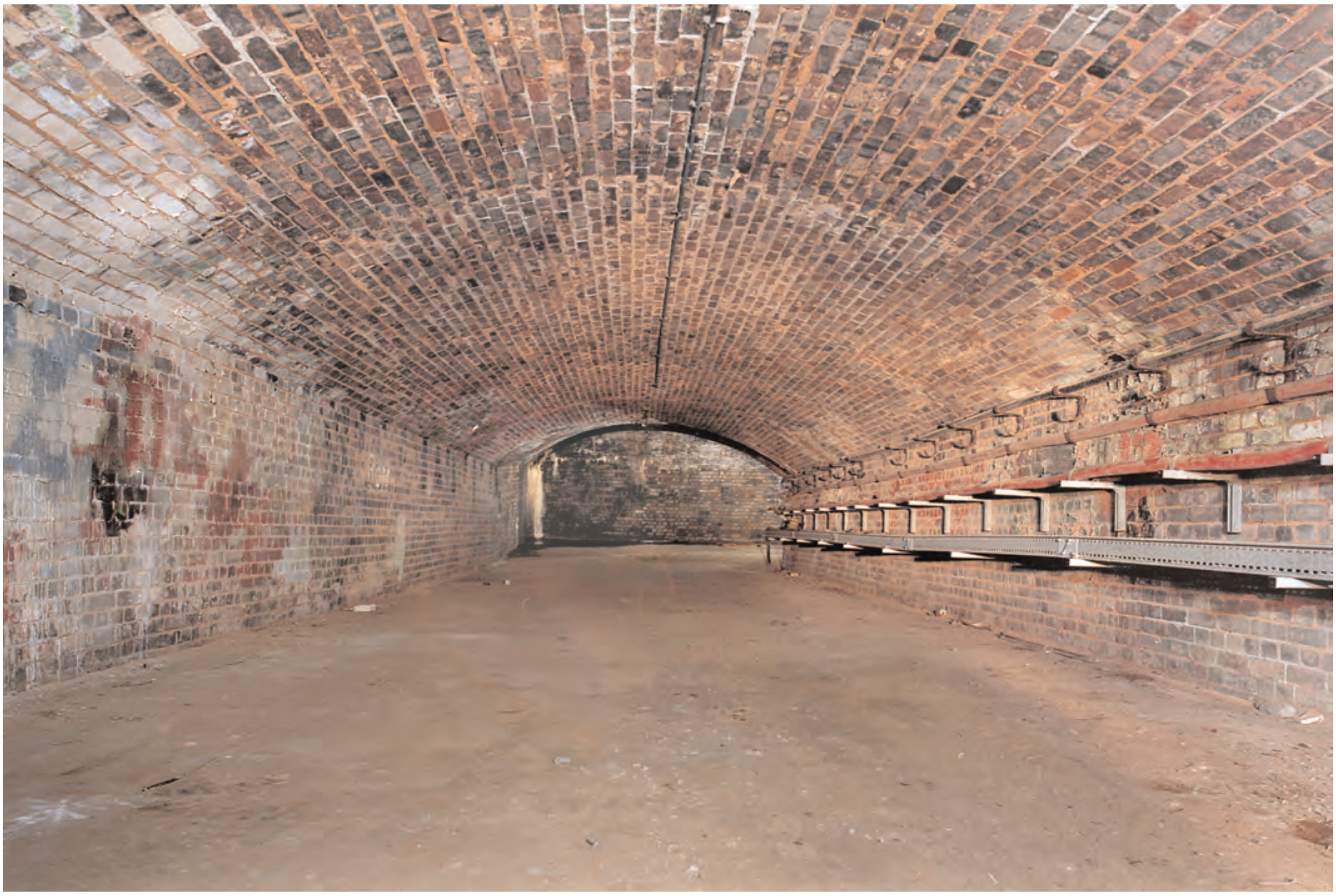
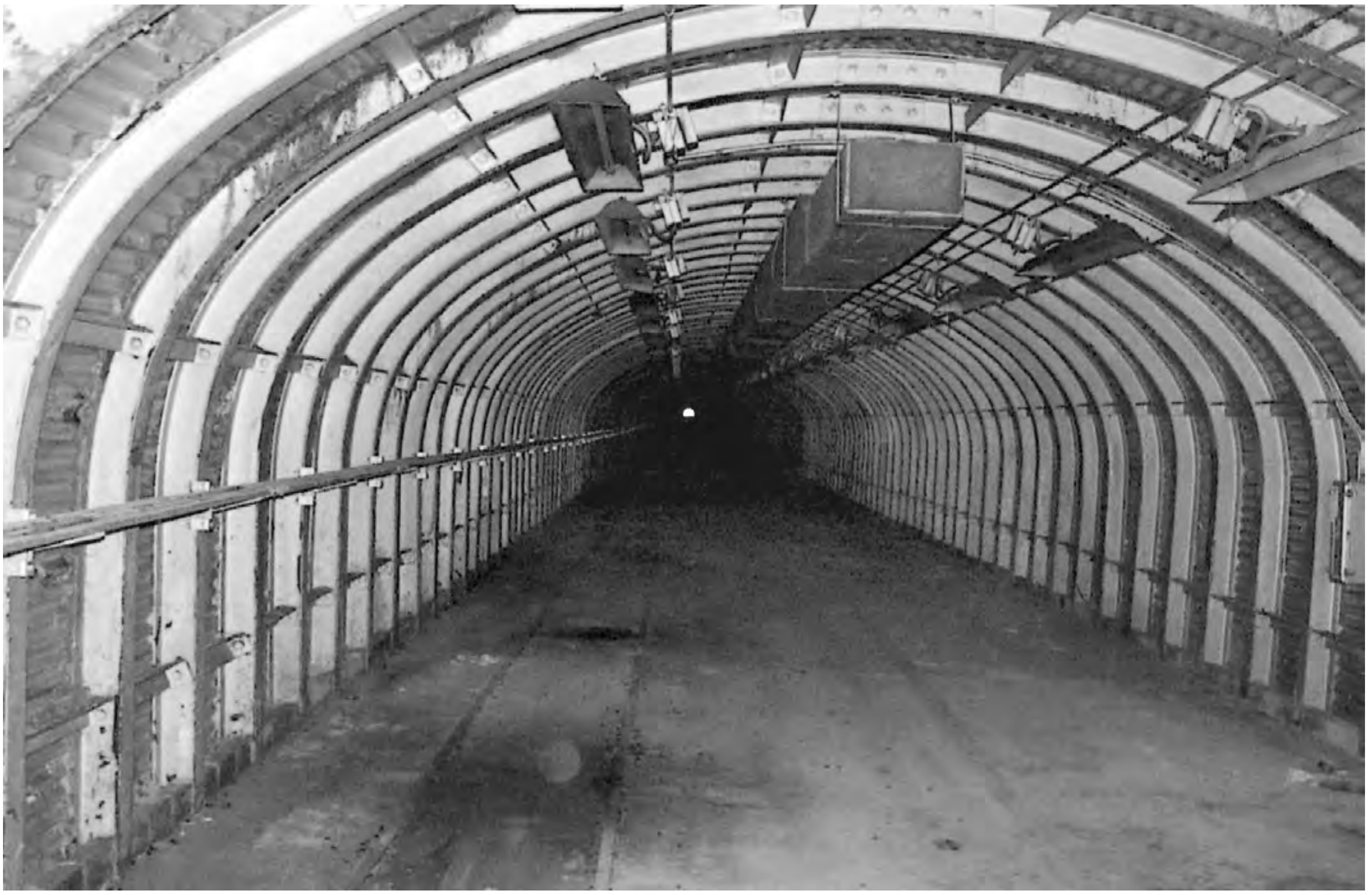


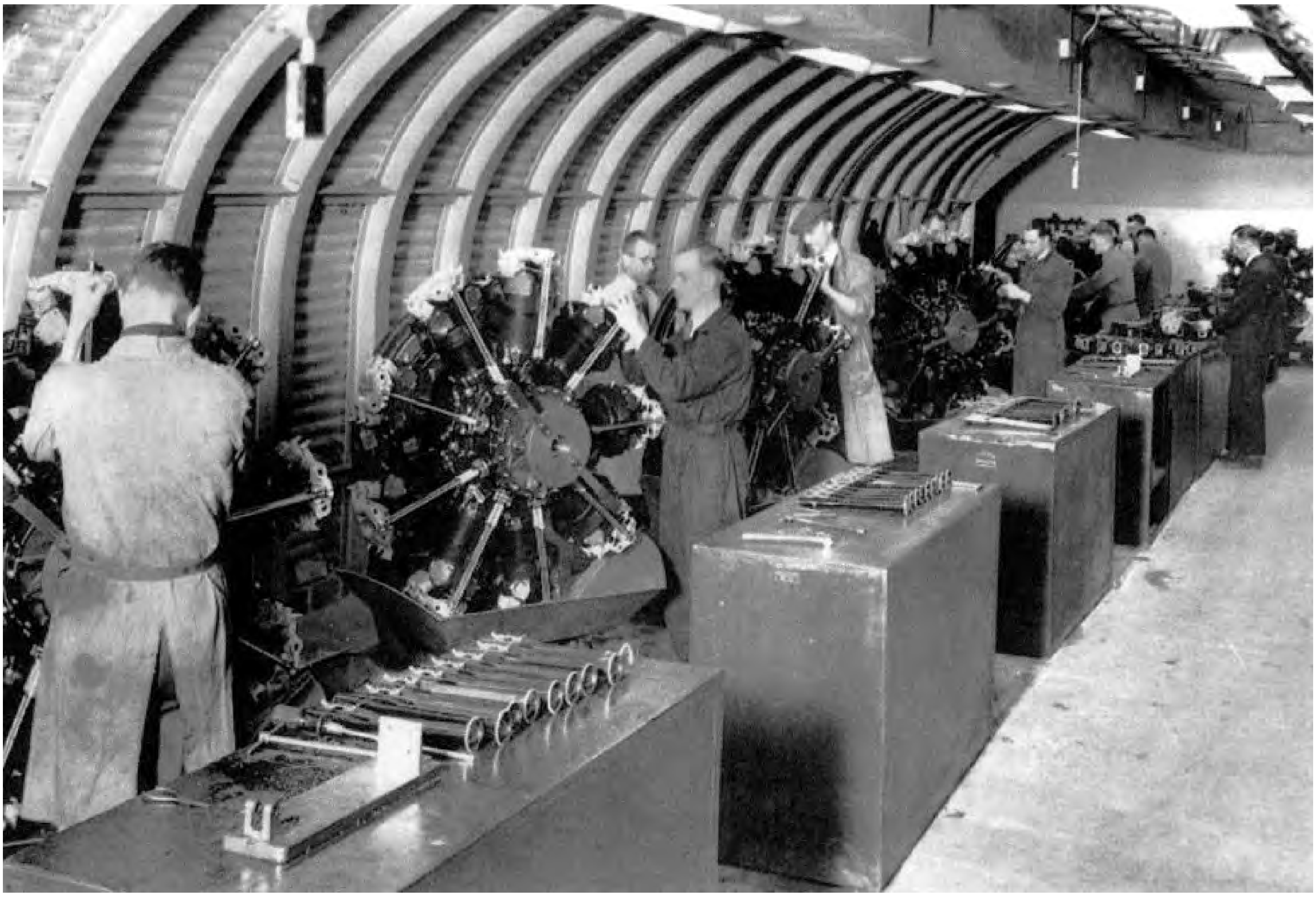
Tunnels at Longbridge - Photos by Nick Catford



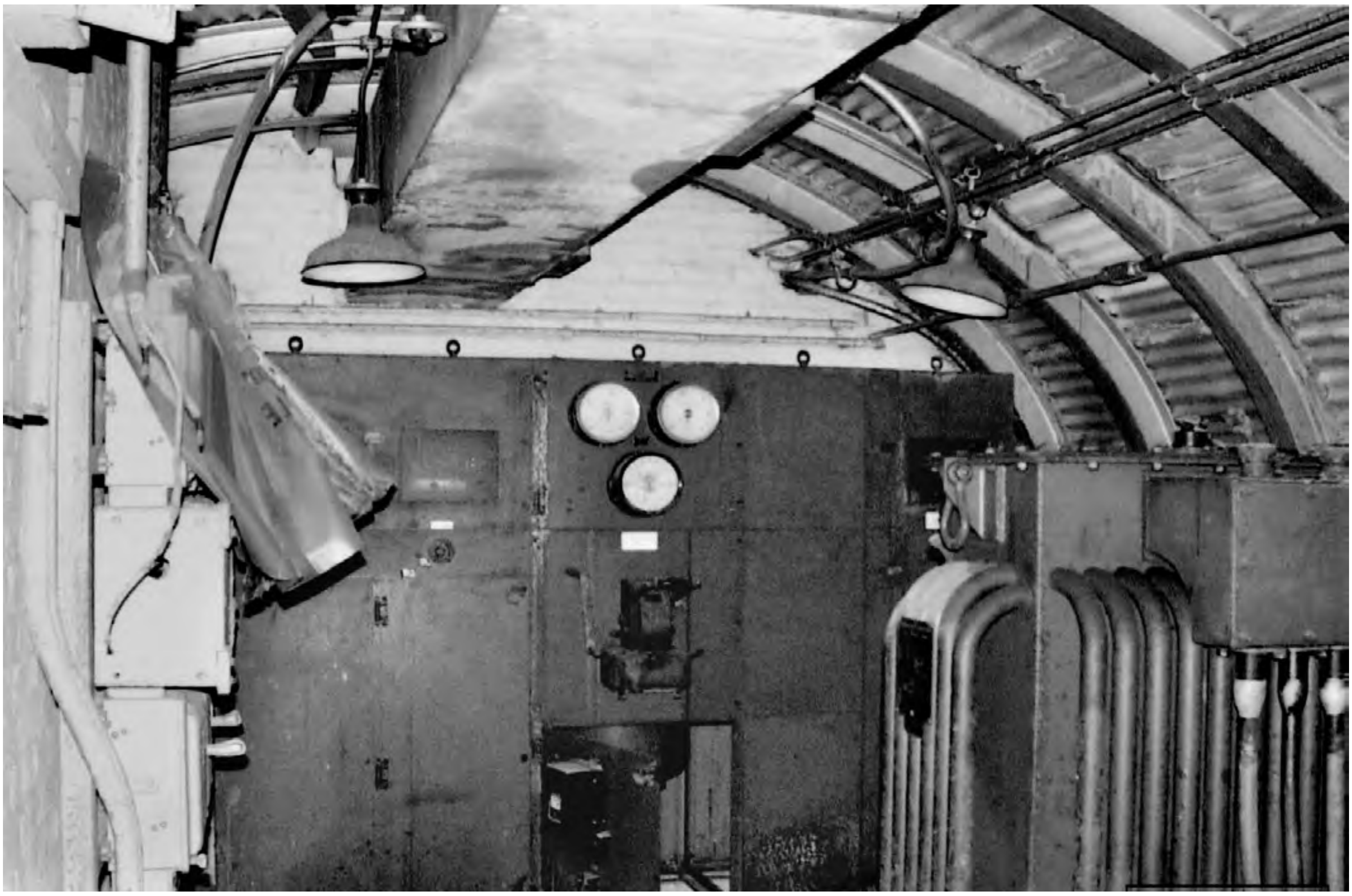
The Austin-Longbridge Underground & Its Culture



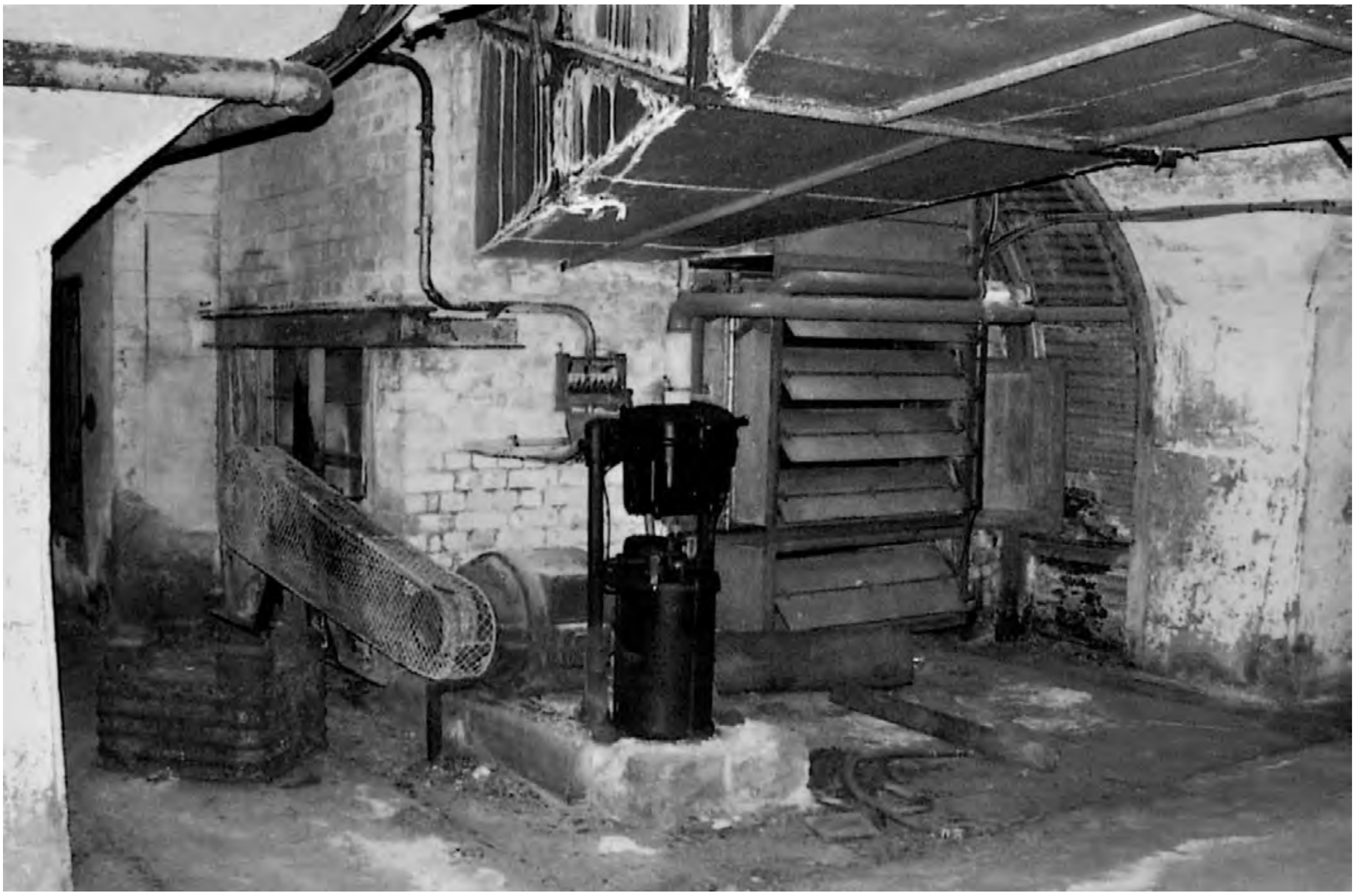
Above: East Works Tunnels. Below: Aero Engine Assembly in East Works Tunnels.



The Austin-Longbridge Underground & Its Culture



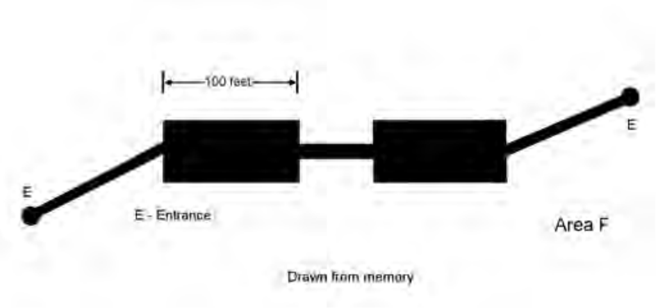
Above: Electrical Switchgear East Works Tunnels. Below: Ventilation Plant East Works Tunnels



The Austin-Longbridge Underground & Its Culture

During 1939 workers employed on shadow factory work were given enamelled badges with the wording AUSTIN MOTOR CO. LTD. SHADOW FACTORY with the area worked in shown, such as AERO ENGINES; also, each badge was colour coded. They acted as security identification for each area, your badge colour had to match your work area colour or you would be in big trouble. Apparently the system did not last the war out due to the administration of the system not keeping up with all the labour and facility changes. These badges are now very rare and much sought after by collectors.

EAST WORKS TUNNELS – AREA F ON MAP



The second East Works tunnel complex has a very obscure history. It has no plans and was not discovered until the construction of the East Works low pressure sandcasting foundry in 1994 revealed underground voids. No records indicate its planned use or existence and no rumours ever surfaced. Due to its design and layout it could be an air-raid shelter or control and command place in case of emergencies. It is a brick and concrete structure, probably built by cut-and-cover as it is only about 12 feet below the surface. It is eight feet high. The main tunnel is 600 feet long and in two places 20 feet wide. Approximately half the area has been fitted out with offices, rest areas, a possible first-aid post and toilets. Some World War II production information was found but no conclusive evidence of what the area was actually used for or planned for was found. It did not appear to be a recognised air raid shelter for the workers in the adjoining aircraft factory as no one can remember using it or knowing of it. The two access points are vertical and not easy to use: these are probably post-war. Access may have been much easier during World War II but this is not certain. Was this complex built and then held in reserve, eventually being forgotten because it was never used and only a few people knew of its existence?

TRENTHAM EMERGENCY HQ - AREA G ON MAP

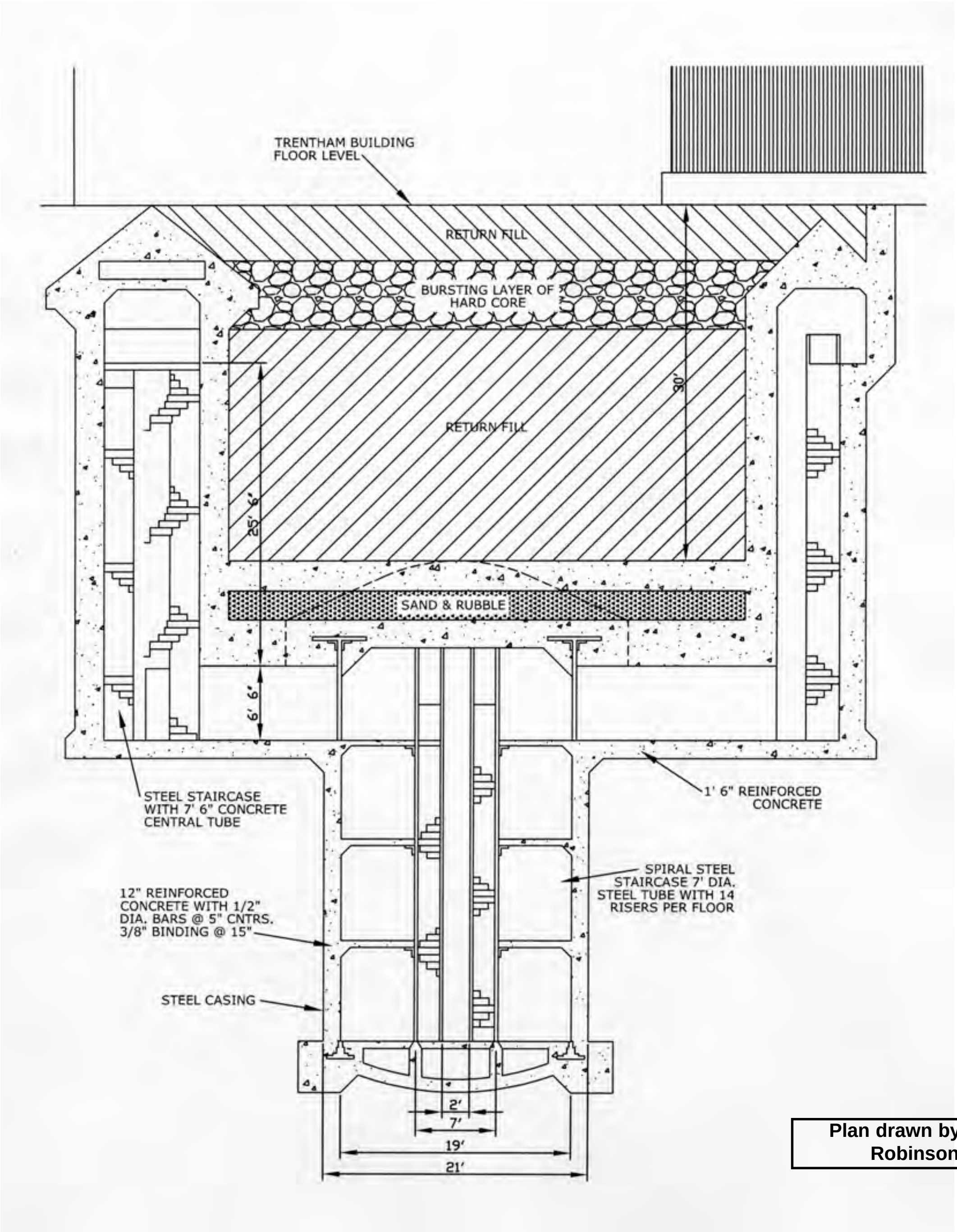
At the west end of the Trentham Building was a heavy looking door in an out-of-the-way place. On opening the door you could walk eight feet forward, turn to the right for six feet then descend seven feet by way of steps to the top of a seven foot six inch diameter spiral steel staircase with a two foot cylinder in the centre of it (see drawing of H.Q.).

After about 40 feet you stepped out of this structure into a 20 feet long passageway with a steel blast door. Through this door the passageway opened out, on the left was an alcove with all the electrical controls. The passageway had another blast door at its other end which led to an escape tunnel with exits to the surface 100 feet away. On the right you stepped into an area of approximately 20 feet diameter. You had now entered the World War II Austin headquarters (from drawing marked ‘secret’, designated ARP 43) for ARP, home guard, AFS, works police, fire crew, works engineers and the most important senior management. The first floor had the obligatory works tea urn, rest or sleeping area, food stores, ammunition, guns and toilets, and most surprisingly a very small fully-fitted bar with semi-circular counter, padded buttoned front, shelves and fitted optics, all constructed to best public house standards (mandatory for any real HQ).

In the centre of the floor was a seven-foot spiral staircase taking you down to level 2. This was the operations level and had a small telephone exchange, incident area, and control and planning area. On the walls were factory plans and a list of whom to contact on declaration of an emergency, together with a large board with identification of control points around the factory running down the left side; along the top was a manned / unmanned row, lots of token hooks created a matrix to show the numbers of people in each control area such as ‘West No. 3 Shelter.’ Fitted desks and filing cabinets with some partitioning completed the floor. Again, a spiral staircase led to the level 3 basement. This contained all the services, air handling and sump pump for keeping the water out. As far as I have been able to find out, the HQ was not used to any great extent, probably because the expected emergencies never occurred; it was kept very secret during World War II and up until about 1964.

Construction took place in the late thirties using the slip ring digging process. You place the bottom floor cylinder

The Austin-Longbridge Underground & Its Culture

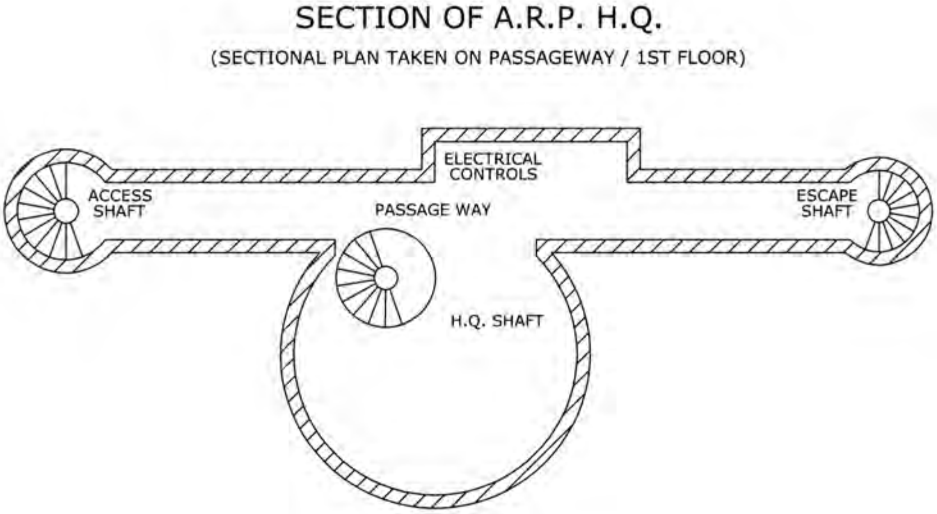

TRENTHAM BUILDING FLOOR LEVEL
RETURN FILL
BURSTING LAYER OF HARD CORE
30'
RETURN FILL
25' 6"
SAND & RUBBLE
6' 6"
STEEL STAIRCASE WITH 7' 6" CONCRETE CENTRAL TUBE
1' 6" REINFORCED CONCRETE
SPIRAL STEEL STAIRCASE 7' DIA. STEEL TUBE WITH 14 RISERS PER FLOOR
12" REINFORCED CONCRETE WITH 1/2" DIA. BARS @ 5" CNTRS. 3/8" BINDING @ 15"
STEEL CASING
2'
7'
19'
21'

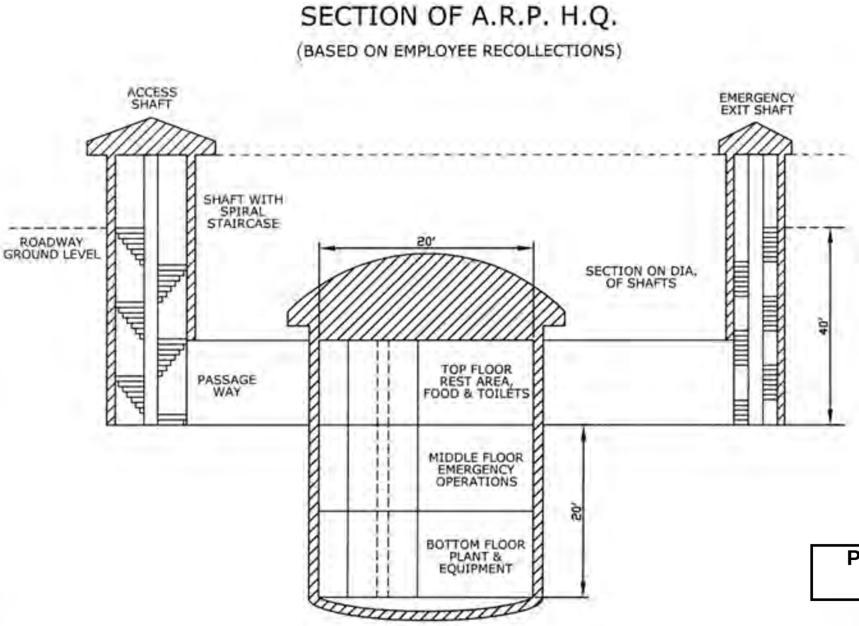
Plan drawn by Tim Robinson

TRENTHAM EMERGENCY HQ - AREA G ON MAP

sides on the ground and dig the earth out from inside, allowing the cylinder to drop down. The next floor cylinder sides are welded to the one in position and digging inside continues. This is repeated until you have an empty cylinder positioned in the ground. Each floor is welded-in along with services, staircases, etc. As the miners approached the final digging out, they ran into damp sand and had to install a permanent sump pump. It appeared that the planned basement floor was not installed due to the water ingress.

A strange feature of this area around the HQ was the presence of a 15-inch gas main only fifteen feet away. In another direction two underground paint solvent tanks of fifty thousand litres stood fifteen feet away, and twelve feet away was the 205 litre bulk paint barrel stores, while above was a paint mix room. Although these facilities dated from post-war times, up to about the late sixties maintenance managed to keep the pump running, fighting the ravages of damp and poor air. Finally they gave up and the HQ was abandoned, already showing signs of rapid deterioration. Up until this time the area had been kept very secret and secure. Around this time I managed to obtain access and was determined to take some photographs. The day I took a camera and flash down the HQ I had an uncomfortable feeling. In the end, my imagination got the better of me and I left without the photos. I suppose I did not want to be the cause of




SECTION OF A.R.P. H.Q.
(BASED ON EMPLOYEE RECOLLECTIONS)
ACCESS SHAFT
EMERGENCY EXIT SHAFT
SHAFT WITH SPIRAL STAIRCASE
ROADWAY GROUND LEVEL
20'
SECTION ON DIA. OF SHAFTS
40'
PASSAGE WAY
TOP FLOOR REST AREA, FOOD & TOILETS
MIDDLE FLOOR EMERGENCY OPERATIONS
20'
BOTTOM FLOOR PLANT & EQUIPMENT

Plans drawn by Tim Robinson

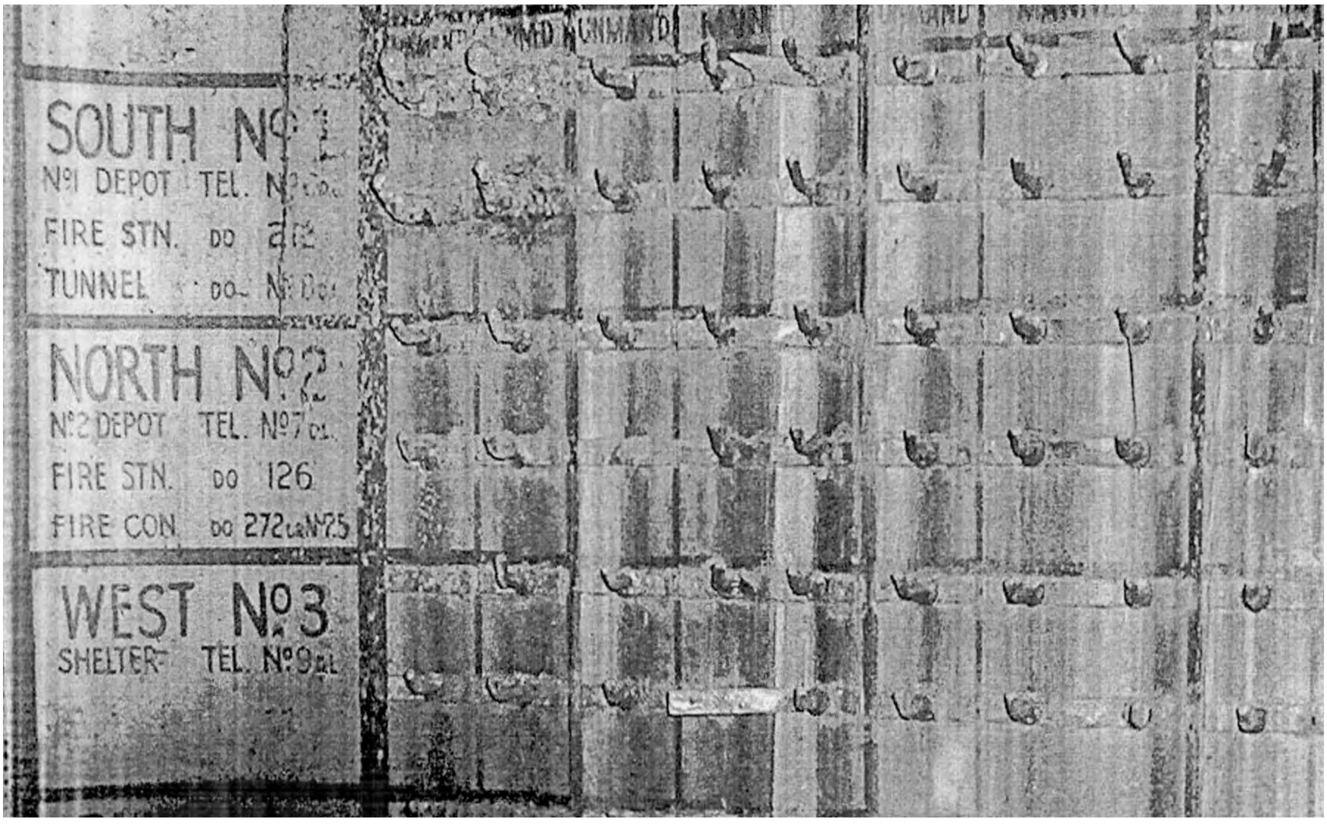
ignition of explosive vapours. The Birmingham fire brigade used this HQ and its escape tunnels for training and said the air was not good at all. They used breathing sets during practice rescues. Their favourite was to blindfold a fireman, another fireman then led him down to the basement level using a torch. The rôles were then reversed, but without the use of a torch to lead them out They also prevented him going out the way he had come in by securing the blast door, forcing him to find the emergency escape route. A number of times firemen had to be led out due to low oxygen and imminent panic.

Gradually the water level rose in this area and eventually stopped twelve feet from the surface. Around 1990 a colleague had it pumped out to have a look at it. It was pretty horrible and rusting away. In 2003 it was pumped out again and surveyed. The result was that it was declared extremely dangerous and mostly unrecognisable. It now lies slowly disintegrating into obscurity.

Directly across the main road from the HQ was Nazareth House (originally the Austin Training Centre), an orphanage run by nuns. Rumours had persisted about a tunnel linking the two sites. This link would have been used by Austin management to give the nuns assistance if they had any problems. I never found the access at the HQ end and when Nazareth House was being demolished I looked for access but found nothing, so just another leg pull rumour.

The Austin-Longbridge Underground & Its Culture

Trentham WWII HQ Above: looking down the entrance shaft. Below: The Shelter control Board



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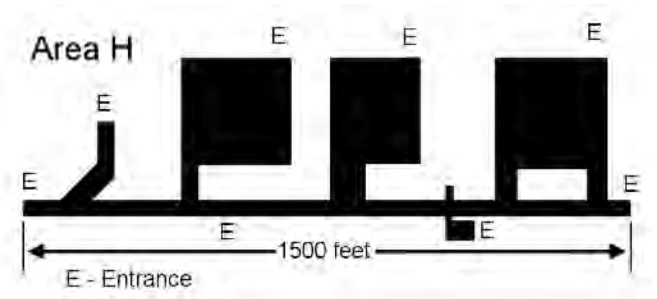
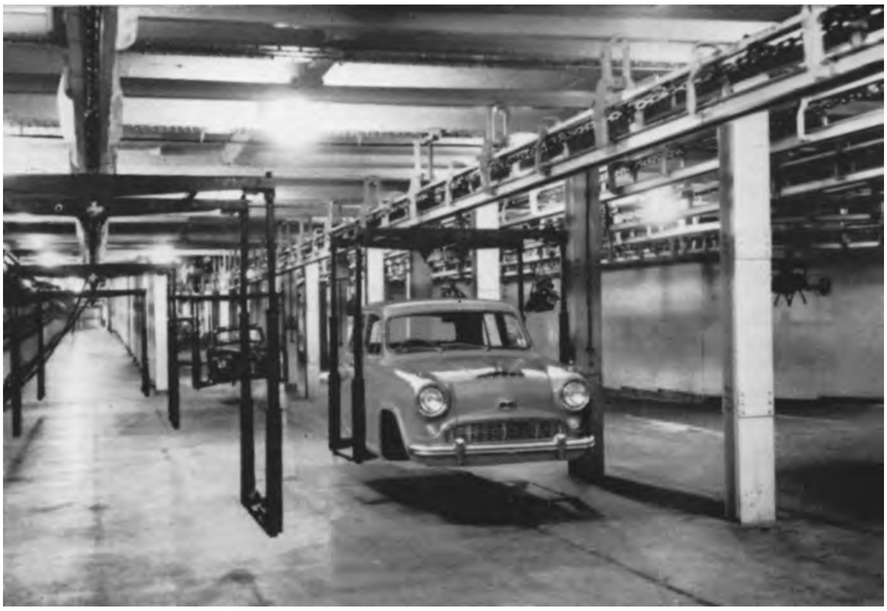
CAR ASSEMBLY BUILDING NUMBER 1 (CAB 1) - AREA H ON MAP



In 1951 the CAB 1 was completed on the Flying Ground hill. It took advantage of the topography of the site by feeding painted bodies and engines out of the Trentham building roof via a bridge into a large tunnel complex that fed the selected body or engine to its correct position on the build tracks. It always looked surprising to see a body suddenly appear out of a hole in the floor and position itself over its engine transmission and suspension and then in a synchronised movement lower itself down without the build track pausing. The tunnel system was constructed using the cut-and-cover system and had exceptionally thick concrete walls and roof with heavy columns and beams. This meant it could not only take the weight of conveyors plus bodies but could also support the plant, equipment and road traffic above.

A ramp at the end allowed lorries to drive down into the tunnel system to supply services. The maintenance department had workshops as bases from which to maintain the complex conveyor systems. The tunnels also carried steam, water, power, compressed air and communications systems. Leading off the main tunnel system were small service ducts taking services to other parts of the site. The tunnel system was easily accessed by many staircases and was continually used as a walkway between sections of the factory, particularly useful on a winter day. The cloakrooms, toilets and mess areas in CAB 1 were not protected but the tunnel system would have provided an easily accessible air-raid shelter if required. A number of people told me of a link into the lower level tunnel system that ran some 100 feet below but I never managed to find any evidence, other than an air shaft.



CAB 1 Tunnel

During the construction of the CAB 1 tunnel system, a building worker disappeared and was never seen again, many rumours evolved from this situation mainly centred around a ghost to be seen in the tunnels in various forms. The local maintenance staff promoted many stories and also provided the props to catch people out and many people used to relate experiences that were obviously set up for the gullible to take in. One nightshift when I was a foreman the workforce had been sent home and all the conveyors shut down; I decided to visit another part of the works via the tunnel which was silent. After walking for about 200 feet I could hear distinct footsteps behind me, although a glance around me revealed nothing. It was not easy to see people as the car bodies hanging from the overhead conveyor obscured the view. Convinced that maintenance staff must be up to their tricks I dodged behind a column and ducked down to look under the car bodies which hung about two feet from the floor. This gave me a clear view of the floor area. After about ten seconds the footsteps stopped but I could not see anyone. Gradually I made my way back up the tunnel eliminating all areas that some one could be hiding in. I found no one, so I retraced my original route as it must have been an echo but no footsteps could be heard. I have no logical explanation for this: it was just ‘one of those things.’

A paint shop manager related an experience of when one night he was inspecting some car bodies as they went up the tunnel. A person spoke to him, but when he turned to look at the person no-one was there. I suspect this was a set-up, but from that night the manager avoided ever walking on his own in the tunnel.

At the start of the tunnel system worked a small group of people called Sequence Control. They ensured the right body met the right engine, seat type and specification as required by the customer. This is quite easy to do these days as we have powerful computers and interface systems to work the conveyers, order the parts, and schedule them to be in the right place at the right time. Back in the late forties computers were not available. The system used was a Hollerith (now IBM) device designed for recording alpha-numeric information onto punched cards. The card reading machine looked like something out of the 1920s designed by Heath Robinson but was well made and provided the basic signalling system for all the conveyor switch points and the sequence information for the vehicle's other components. The machine was driven from the main body conveyor via vertical and horizontal shafts. The operators worshipped the machine as if it broke down they had to run around switching things manually and making phone calls to other areas. They could only do this for a short time before the brain went numb with fatigue.

To aid rapid movement in the tunnels, the Sequence Department had a Vespa scooter. One night, the rider overshot the end of the tunnel in the Trentham roof. The bike went under the safety barrier and crashed to the floor. Its remains were heaved into the scrap skip and quietly forgotten and the bike was never replaced.

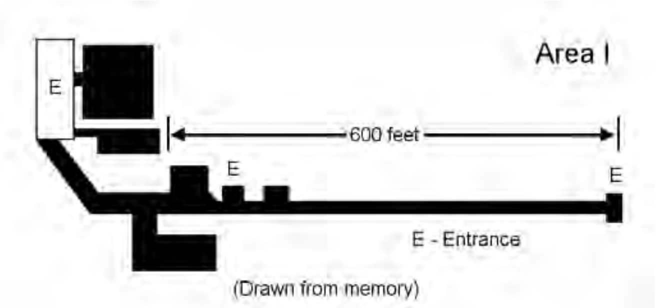
As computers became available, their use was proposed, but the change-over timing was always too long and difficult. So the Hollerith was looked after with extra care and lasted up to 1980. Suggestions were made that it should go into a museum but, due to difficulties dismantling and removing it, I believe it ended up in the scrap wagon. A pity, as it was a unique piece of equipment and would have looked interesting in a museum.

I was told that a contractor once parked his van in the tunnels one weekend. Unfortunately, maintenance decided to run some bodies on the overhead conveyor as a test. The body slinging cradle ends ran across the bonnet of this van, putting some really serious grooves in it. When he came back to his van on the Monday, the bodies had disappeared leaving behind his damaged bonnet. He went ballistic until somebody pointed out the 'no parking' and 'restricted access' notices in the area.

Under the main entrance to CAB 1 offices was a stairwell which went down to two basement rooms adjoining the body conveyor tunnel, with a pedestrian tunnel leading from them under the main body tunnel with steps up to the other side of the main tunnel. No specific purpose for their existence was ever established: we used them for storage.

CAR ASSEMBLY BUILDING NUMBER 2 (CAB 2) - AREA I ON MAP

CAB 2 was built in 1961. Bodies were fed via the CAB 1 tunnel system and a bridge into Number 4 Paint Shop, finally moving by internal overhead conveyor onto the floor-mounted build tracks. The conveyor drives were in underground pits with linked tunnels to adjoining maintenance workshops and stores. Tunnels were also constructed for an 'under-tug' system which sequenced components to each vehicle being built on the assembly lines.



The main pedestrian entrance to the paint shop was via steps down into a foyer with offices, toilets, rest areas, and cloakrooms all below ground level. Leading from the foyer were two tunnels leading to the main factory floor and the maintenance tunnels. The roof in these areas was thick reinforced concrete with heavy beams and columns. It was also the factory floor and had to support any equipment in that area. During the late eighties part of the cloakrooms were converted to offices which, although windowless, had the advantage of being cool in summer and warm in the winter. For some time I had an office in this area. During some trench work outside the office, I noticed the appearance of aircraft runway foundations and top-surface from World War II. By measurement I found that, when I was sat at my desk, the runway surface was about level with my eyes. It was not difficult to imagine the roar of a Merlin engine in a Hurricane hurtling inches above my head as it took to the skies on its maiden flight.

Whilst in this same office I was involved in a project to build the new Number 3 Paint Shop. During the construction phase in 1999 a large crawler-mounted vertical pile-boring machine was putting the column foundations in, when the operator was surprised by a sudden jerk of the machine and the safety mechanisms cut out. He re-started and all appeared well. As he was at the required depth he started to retract the 18-inch auger and drive shafts. No matter what he did, all he could do was go up and down about 12 inches. He tried reversing the auger and pulling, moving forward and pulling again, but it would not move. After about two hours he gave up and left the auger and drive shaft in place. Meanwhile much discussion was taking place on site, with a clear absence of any Austin people involved, as most of them had a horrible feeling that the auger was stuck in a tunnel roof. The builders never did find out what happened and gas-axed the drive shaft off near the top and filled the shaft with concrete; a very expensive pile as it cost £6,000 to replace the auger and drive shaft. When all the noise had died down I ventured into the tunnel system which I knew very well, convinced I would find the auger. Well, after a short time, I realised it was not to be seen anywhere, so did some tunnels exist that even I did not know about? Or was it buried rubbish? Nothing existed on the plans. Possibly it was a trial tunnel that encountered one of the geological faults in the area and was abandoned. The faults are quite severe and one building is actually split, by design, along the fault to allow the two halves of the building to move independently without any structural problems.

COFTON PARK – AREA J ON MAP

Cofon Park Electrical Box

Cofton Park is owned by Birmingham City Council, and lies alongside the Austin works. The Cofton Hackett area was designated in World War II as vulnerable to air-raid attack. Steps were taken to provide air-raid shelters for the local population and for the Austin workforce. One shelter, actually built by Bromsgrove Rural District Council, was quite large and built into a shallow hill. This shelter was available for Austin workers from the factory as well as some smaller shelters nearer the works. It was demolished along with all other park shelters in 1946 – 1947.

Austin also built a casualty clearing station, auxiliary fire service station together with a large static water tank at the junction of Lowhill Lane and Groveley Lane. In August 1939 914th Squadron ‘D’ Flight RAF established a balloon site and barracks for other balloon sites. Groveley Hall, about a mile away, was commandeered by the RAF as the Midlands Area balloon defence HQ for WWII. It is said that Lord Haw-Haw in one of his broadcasts from Germany identified the white farmhouse in the park as being next to the Austin factory that the Germans would destroy very soon, Within 24 hours Austin workers had camouflaged the farmhouse.

If a major fire had occurred in the East Works, the plan was to position Austin AFS fire pumps at the nearby Cofton Reservoir and pump to static holding tanks in Cofton Park and East Works. This would have provided a guaranteed supply if the local water mains were damaged or insufficient. Thankfully they remained unused throughout the war.

PART C - OTHER AREAS

NO. 3 MACHINE SHOP

Around 1983, part of the old works was being knocked down by a large tracked crane with a huge steel ball. I had seen that he was making short work of this demolition, but when I came past about an hour later the crane jib was lying bent and twisted across the partly demolished factory, and the crane body was on its side having fallen into a hidden underground area that was not on plans and nobody knew about. The area dated from about 1916-1918 and no reason or use for the cavity could be found. This was not the first or last incident of this nature and all future building contracts contained the clause that it was the contractor’s responsibility to check for voids below the working surface. Many did not bother, to their cost.

NO. 5 MACHINE SHOP

Soon after I started my apprenticeship, I was taken by a more senior apprentice to the ‘meeting place’, a cloakroom and toilets area on the edge of No 5 machine shop. This was my first introduction to underground Longbridge. It was ideal for apprentices to meet, sleep or hide from authority; and a great information exchange point on all subjects such as college homework, young ladies, cars, and rock-and-roll. It was constructed with many columns and a very thick concrete roof built in the early fifties. It had the characteristic air-raid shelter feel to it. If the place was raided by Apprentice Department staff or works police, a high proportion could usually hide or make an escape. At the other end of the building was a similar area, but this had a large 45 x 45 foot bunker-type room with air conditioning and heavy steel doors. This was used as a model shop for new factory layouts and models of new equipment and designs of machine tools. It was a secure area and only senior people and those who worked in it were allowed in.

Over the years its importance and security diminished and around 1982 a few mad-heads in the adjoining planning department decided to hire a stripper for the dinner time of the last day before Christmas with a limit of 60 people at 50p a ticket. The organisers soon increased the number to 100 and then lost control as they just carried on selling tickets. Come the day of the stripper, a steady stream of people made their way to the bunker, gradually filling it to capacity. People were jammed in like sardines, some lay on top of cupboards, others stood on and in machinery. The poor girl was led in and was absolutely astounded. Anyway, a tiny little area was created for her and she strutted her stuff to the crazed enthusiasm of all. Hands appeared to be coming from all directions trying to grasp a piece of the action but she performed well and escaped unmolested, well almost. On her departure the place began to empty,

The Austin-Longbridge Underground & Its Culture

revealing one person trapped behind a machine tool and another having breathing difficulties. The trapped person was freed and the other carted off to the first aid centre. For the rest of the afternoon the event was the talk of the offices, some of the older attendees probably not having seen anything like it before. It really affected some of the older draughtsmen who had difficulty getting pencil to board due to the fact they were still shaking with excitement. For a number of weeks at the start of the New Year you could not open one of the drawing store cupboards as it had been heavily distorted by the crush of people. The builders of this bunker would not have dreamt in their wildest dreams of this day's event. It was never repeated and passed into the annals of Longbridge history.

NORTH WORKS

Little is known about North Works (demolished 2006) although it had an underground toilet and rest area that was fully fitted-out but was never used. It was part of a basement storage area that could have been used as air-raid protection during Word War II. When carrying out work on the floor slab for the installation of a large grinder the driver of an excavator had quite a shock when he dropped 12 feet into the basement area.

THE ADMINISTRATION BLOCK

Under the Administration Block (known as 'the Kremlin') built in 1948 were a number of basement offices housing such functions as the Photographic Department. These were linked by corridors and stairs to the ground floor and to the outside ground level via steps at the rear. Again, rumours existed about an underground HQ for the directors but no drawings existed and I never found any evidence, but it could have been well hidden as I did not have total access to the area. Another rumour was that there was a link into the Flying Ground tunnels. I never found a link, but an element of truth existed because you could access the service ducts which ran into the CAB 1 tunnels. Not a good idea as they were always extremely hot, very small and full of dust and dirt: not recommended at all!

THE SUPPOSED UNDERGROUND HOSPITAL

A strong rumour has always persisted concerning an underground hospital. No specific known complex exists: any of the tunnel complexes could have been converted into casualty treatment areas. Probably the most suitable would have been the Flying Ground tunnels and the West works No. 2 complex. Throughout the works small and large first aid rooms existed staffed by nurses, also within the Austin emergency services a medical Home Guard unit operated. First aid posts also existed in all the tunnel complexes. The number of people involved with medical services does seem to have been disproportionably high and may have been the basis for an emergency hospital rumour. Extensive research has not found any positive evidence other than a feeling that something was planned but was never needed to be put into practice. Dorothy Chinn of Catshill was a superintendent in the St Johns Ambulance Brigade and a senior tracer in the designs area at Austin as well as a senior nurse in the Austin Civil Defence Casualty Service. No doubt she would have known of these plans if they existed.

WEST WORKS

The new Metro building was quite unique to Longbridge as it had virtually no underground parts. It had a very large rail deck and it always seemed strange to see a large train and wagons disappear into the factory. They transported pressings from Swindon to Longbridge in a continual merry-go-round.

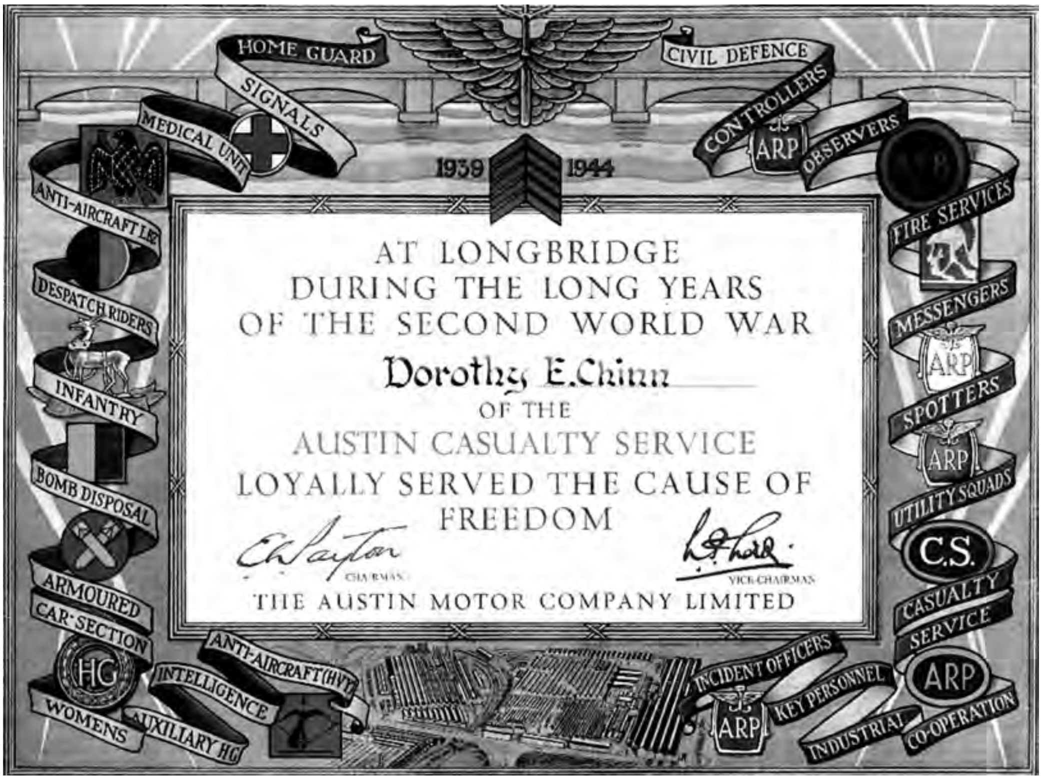
The Old West Works (demolished 2006) which fronted on to the main A38 road had a number of underground features. The press shop steel store had many columns supporting very thick concrete and was used as an air raid shelter as well as sheet steel stores. The basement area fronting the A38 had a number of heavily reinforced rooms, again used as air-raid shelters and secure stores. One room about eight by six feet had a heavy steel door and lock and was the armoury for West Works containing up to 500 rifles ready for use. It was last used as the milk store for the workers who used lead. They had two pints of milk a day to help negate the effects of lead dust: this was not medically proven to work.

There was also a rail deck that was effectively underground, having many columns and a very thick roof that was the floor of the workshop above. Items that are known to have been manufactured in these areas were Bren gun parts and shell parts.

AUSTIN LONGBRIDGE WWII DEFENCES

The works were surrounded by balloon and anti-aircraft defences; they had a virtual ring of steel surrounding them. At the rear of West Works towards Frankley was an anti-aircraft gun emplacement known as Big-Bertha. This was a large single gun and the first time it was fired it shattered many windows in local houses: it was never fired again.

Positioned on some high ground in Groveley Lane, just past the railway bridge, was a large anti-aircraft rocket battery. These rockets were made by Cadbury's at Bourneville, about three miles away. When fired they made a tremendous noise. One afternoon all was normal with no air raid warnings when six rockets were fired, on purpose or by accident: nobody knows. They screeched over the top of East Works causing absolute pandemonium as people dashed for the shelters not


HOME GUARD
CIVIL DEFENCE
SIGNALS
MEDICAL UNIT
CONTROLLERS
ARP
OBSERVERS
1939
1944
ANTI-AIRCRAFT LT
FIRE SERVICES
DESPATCH RIDERS
MESSENGERS
ARP
INFANTRY
SPOTTERS
ARP
BOMB DISPOSAL
UTILITY SQUADS
C.S.
ARMOURED CAR SECTION
CASUALTY SERVICE
HG
ANTI-AIRCRAFT (HVY)
INTELLIGENCE
INCIDENT OFFICERS
ARP
KEY PERSONNEL
ARP
WOMENS
AUXILIARY HG
INDUSTRIAL
CO-OPERATION

AT LONGBRIDGE
DURING THE LONG YEARS
OF THE SECOND WORLD WAR
Dorothy E.Chinn
OF THE
AUSTIN CASUALTY SERVICE
LOYALLY SERVED THE CAUSE OF
FREEDOM

CHAIRMAN
VICE-CHAIRMAN
THE AUSTIN MOTOR COMPANY LIMITED

knowing what was happening. Future firings were notified to the workers.

In the Longbridge area no pillboxes or defensive positions appear to have been built, certainly nothing in the works. The Austin home guard and civil defence organisation had 4000 volunteers, the home guard units consisted of signals, medical, heavy and light anti-aircraft, despatch riders, infantry, bomb disposal, armoured car, women's auxiliary and intelligence. The civil defence units consisted of ARP controllers, observers, incident officers, fire service, spotters, messengers, utility squads, casualty service and industrial co-operation officers.

A foreman I knew was a sergeant in the Home Guard (very much a Corporal Jones of 'Dad's Army' type.) He proudly told me one of his specific duties was to maintain a reserve of explosives and detonators to be used to destroy key equipment in the works if the Germans had invaded. At the time I did not take too much notice of what he said: I wish I had had the foresight to really question him and record it. Another foreman said he used to leave home at 07.00, work his shift then go on to home guard duties arriving back home at 22.00 or later

A FINAL COMMENT

I hope this document has fulfilled my purposes set out at the beginning It can now be used as a key to releasing any additional information that I am sure is still waiting to be discovered and placed on record.

ACKNOWLEDGEMENTS

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PICTURE CREDITS

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Ice Houses associated with Grottoes and Follies

Sylvia P. BEAMON MA (Cantab)

Abstract: This paper reviews the recorded history of conservation of ice and snow during the summer months, the evolution from the use of natural cavities for such purposes to purpose-built structures for ice conservation and food storage, and the use of ice-houses as garden landscape features and, possibly, adaptation of 'follies' for practical ice-conservation purposes in Britain. References to published specific examples are provided.

Keywords: Ice-houses / storage / garden archaeology / follies / grottoes / secondary uses

INTRODUCTION

There is mention in literature that ice was stored in 'grots and porches.' What exactly does it mean? Well, your guess is as good as mine. Were the grots constructed grottoes or natural caves? Certainly natural hollows and natural caves have been used for ice storage in mountainous areas abroad. It is readily observed at high altitudes, or in high latitudes, that winter snow and ice will last long into the summer in such places. At least one recorded cave example was in Wales, at Plas Newydd, Gwynedd, a seat of the Earls of Uxbridge, the occupier being elevated to become the Marquess of Anglesey after Waterloo (Beamon and Roaf, 1990, page 519) The estate records at Holkham Hall in Norfolk do not give any idea what or where the 'porches' and 'grottoes' were that are referred to in the following terms (Beamon and Roaf, 1990, pages 351-52):

January 1739/40 Filling the grottoes with ice.

23 February 1739/40 Filling the under part of the porches with ice, 13s. 3d.

Work on new porches.

Perhaps the Temple with its Tuscan portico was used, or even the Triumphal Arch? (Headley and Meulenkamp, 1986, pages 357-58)

Ice-houses were associated with 'eatables,' the kitchen garden, under the dovecote or nearby, perhaps including a store for deer and other game. Sometimes hooks within the ice-house itself, above the ice, were used for this purpose. When an ice-house was decided upon for a property, the question arose, where to put it? Not always the kitchen garden, if the geology was unsuitable and the water source from where the ice was to be collected was far away from the main house.

In 1975 I delivered a paper on ice-houses at the Société Française d'Étude des Souterrains conference in Paris. At the following year's conference French and German papers on this topic were presented. By this time, I had already started a card index of these structure in Britain, and was amazed at the number I was locating. My collection of reference material was steadily increasing, too. In 1980 I invited Susan Roaf, and architect, to join me in writing a book, to which she readily agreed. Unfortunately it was necessary for her to live abroad, with the result that the analysis of the ice-house survey sheets for the gazetteer section of the book was left entirely to me. It took ten years before our work was published. It is now the standard British reference book on the subject (Beamon and Roaf, 1990.)

In addition to studying the conservation of ice and the refrigeration of food in ice-houses from the 17th century to the present time, I have researched these topics backwards in time. So far, the earliest record I have found of man preserving food by 'refrigeration' comes from Prof. McBurney's excavation at a site La Cotte St. Brelade, on Jersey. There is evidence that man was storing rhinoceros and elephant meat in permafrost as a 'deep-freeze' 140,000 years ago (Rissian Age)(Beamon, 1977.) Man has stored ice for commercial as well as domestic use since very early times. The Mesopotamians, Greeks, Romans, Persians, Chinese, and others, were all familiar with the practice.

LATER HISTORY

History books maintain that the concept of ice-houses arrived in Britain when King Charles II's gardener, one Rose, brought the idea back from Versailles, France, in 1660. He then directed the construction of several ice-houses at Upper St. James' Park, and Greenwich, in London, and on the Windsor estate, Berkshire. However, from the King's works accounts of James I of 1619 - 20, some 40 years earlier, a similar construction is mentioned as a 'snow conserve,' 30 feet [9 metres] deep, 16 feet [4.8 metres] across, with a thatched timber house with a door built over it (Lander, 1982.)

At least one ice-house is earlier still. The Ormerod House, Lancashire (now demolished) example was incorporated in one of the main house walls, which can be dated to 1595. It is to be remarked upon that the owners were French. There are a few reports of yet earlier structures for the same purpose sited in some abbey grounds. One such 'hole in the ground' now holds an anthrax-contaminated cow, precluding excavation! (Beamon and Roaf, 1990.) Our 12th century monarch Richard I [1157 - 99], who spent little time in Britain, knew of ice storage. He even sent an iced sherbet to Saladin [1137 - 93.]

Returning now to the 17th century, Robert Boyle [1627 -

91) in 1665 recorded that snow and ice were kept all summer long in Italy and elsewhere. It seems he had received an account from a contemporary, the diarist John Evelyn [1620 - 1706], who wrote:

'To conserve snow they lay clean straw upon the grate or wattle, so as to keep the snow from running through whilst they beat it to a hard cake of an icy consistence, which is near one foot [0.32 metre] thick, upon this they make a layer of straw or reed (for I remember I have seen both) a competent thickness overall, and keep the door locked. This grate is contrived, that the snow melting by an accident in laying, or extraordinary season of weather, may drain away from the mass, and sink without stagnating upon it which would accelerate the dissolution and therefore the very bottom is but slightly steened. Those who are more circumspect and curious, preserve a tall circle of shady trees about the pit, which may rather shade than drip upon it ..' (Boyle, 1665.)

In April 1667, King Charles II [1630 - 85] held a celebration when cherries, strawberries and ice cream were all served - unheard of novelties to appear on an English table in Spring (Beamon, 1975.)

During the next 200 years, outside ice-houses rapidly became popular with the landed gentry. The fashion, descending the social scale, led to commercial premises - fishmongers and confectioners who bought in ice to sell to the general public.

With a few exceptions, one just mentioned which was presumably used by and belonged to the Crown, ice-houses were used primarily to store the ice itself, but in the early 19th century Papworth (1818) expounded:

'The ice house forms an excellent larder for the preservation of every kind of food that is liable to be injured by heat in summer; thus fish, game, poultry, butter, etc. may be kept for considerable time.'

And certainly game, poultry, joints of meat and sides of bacon were hung from hooks set into the roof of some of them, while fish, fruit, and dairy produce could be laid directly onto the ice itself, perhaps on a bedding of straw or on a temporary floor of timber boards placed over the frozen expanse. A letter by Lt. Col. W.H. Kingsmill published in Country Life in 1962 explained that he remembered his father saying that in the 1890s he (his father) recalled eating partridges from the ice-house in July. In this case, the ice was packed in first and the game strewn on top of it. This manner of storage may at the time have been considered an innovation, but the Roman satirist Petronius, in the 1st century AD, maintained that at the beginning of the Roman Empire, the extravagant tastes of the 'new rich' stimulated imports of luxurious food such as oysters from Britain, and the building of cellars in which snow and ice served to preserve such delicacies (Forbes, 1955.) These oysters presumably travelled alive in constantly replenished sea-water, rather than dead and, packed in well-insulated snow!

STRUCTURES

British structures for holding ice range from simple pits, known as ice-pits or ice-wells, to elaborate and stylish buildings which in general are called ice-houses. Commonly, they are built of regional materials and are of local design, often set into hillsides or beneath a natural or man-made mound. Quite a number were designed by the famous landscape gardeners of the day, such as 'Capability' Brown [Lancelot Brown, 1715- 83], the Wyatt family and the Wyatvilles, all designers of gardens, garden outbuildings, ice-houses, and follies. Usually ice-houses were sited sensibly near lakes so that ice was readily available to stock them in the winter months. Some ice repositories were built completely above ground, as noted for example in the waterlogged areas of the Norfolk Broads and Great Yarmouth (Norfolk), whence ice was taken to the North Sea fishing fleets for fish preservation.

Ice-houses were built in many different shapes and sizes, domed or globe-like; circular; rectangular; and more rarely tunnel- or bell-shaped. The best, however, were considered to be the subterranean or semi-subterranean egg-shaped ones, with the narrow end pointing downwards. When the ice, in this type of house, began to melt the compacted mass would slide down into the narrower area, packing it tighter and so slowing down the melting process. Most ice-houses had a drain to lead the meltwater away, and some of the later designs had ventilators to keep the chamber as dry as possible. It was found that the standard ice-house was expensive to construct. In the first quarter of the 19th century William Cobbett [1763 - 1835] designed more modest forms, mainly above ground and using cheaper materials. The 'ice-shed' or temporary ice stores opened the way for a larger proportion of the general public to enjoy the luxury of ice all year round.

The skill of packing the ice-house was very similar throughout the centuries. The introduction of cavity walling, possibly as early as the early 19th century and certainly by the 1880s, to aid insulation became more general. The chamber was lined with straw and a horizontal trestle, or even a redundant cart-wheel, was inset towards the base, leaving a space below to collect and conduct away the meltwater. This was covered with a layer of straw about one foot [0.32 metre] thick. Alternate layers of straw and ice or snow were then built up until the ice-house was full. For added insulation, the outside was often covered with soil planted with ivy and shrubs, but the roof might have been thatched, tiled, or covered with flagstones. This roof often had a hole or chute penetrating the top, though which the ice-house was filled. In the case of hillside ice-houses, teams of horses dragged ice up to a point above the chute and there unloaded it, pausing as the alternating layers of straw were set in place. The ice-house often had an entrance passage at the side so that access could be gained during the summer to collect ice for use. Dependent upon the terrain, this passage was sometimes also used to trundle in barrow-loads of ice in the winter.

GARDEN FEATURES

It is not always possible to determine the exact nature of a garden feature, and these, once under construction, or constructed, can then be altered at the whim of the owner. One such is the grotto-icehouse. Which came first, the chicken or the egg? Close to Chettle House, Chettle, near Farnham in Dorset (ST 951132), built in 1710, is a walled garden which contains, inter alia, what can best be described as an underground room. Its exact function has not been determined: ice-house, pigeon-house, wine cellar? But where was the estate ice-house, if not here? However, there is mention that a long barrow on the edge of the estate was dug into to form a grotto before 1767, and it is possible that this feature was in fact an ice-house (Beamon and Roaf, 1990, page 246.) In Glamorgan, at Dyffryn, Neath (SS 733990), to the south-west of the house, is a small stone building (a ruin or a folly?) built into a bank. From its rear wall a small chute leads to, perhaps, an ice chamber below. Was this built as an ice-house? (Beamon and Roaf, 1990, page 531.) The very well preserved structure at Charborough Park, Dorset (SY 925978), (formerly Drax estate, Morden) is known as 'The Grove ice-house or grotto.' It was a feature of one of the formal gardens, next to a summer house. The entrance is ornamented by two large urns (see figure) and a statue of Mercury. There is a plaque commemorating a meeting in 1686 in the ice-house when several Dorset gentlemen prepared for 'The glorious revolution.' (Beamon and Roaf, 1990, page 245.)

Quite a number of ice-houses have 'grottoesque' entrances, as for example at The Coach House, Shockerwick, Avon (ST 804685); another is at Upton House, Tetbury (Gloucestershire) (ST 8895) (Beamon and Roaf, 1990, pages 194 and 259.) The Marlow Yacht Marina in Berkshire, formerly Temple House) (SU 8586) sported 'gothic' doors and windows; and that at Newbattle College, about 1 mile south of Dalkeith, Lothian (NT 333658) exhibits [exhibited] fluted Doric pilasters (Beamon and Roaf, 1990, page 501.) Wardour Castle at Tisbury (not Old Wardour), Wiltshire (ST 933267) had a 'grottoesque' porch, with alternate bands of vermiculated and dressed stone, and is believed to have been built by Richard Woods. All was demolished in the 1980s, a cause of grievance to many (Beamon and Roaf, 1990, page 453.) Gosford estate, seat of the Earl of Wemyss, at Longniddry near Haddington, East Lothian (NT 454786) had an elaborately decorated front to the ice-house, 20 feet six inches [6.3 metres] wide, 11 feet [3.38 metres] high, with a depth of six feet [1.85 metres] to the start of the tunnel at the back. This would have made an admirable porch to hold ice if some was left over when the ice chamber beyond was filled. The entrance is studded with tufa and rustic materials, with an ornate cross above. Inside the porch the walls are surfaced with tufa, shells, flints, and glass. Externally, a man-made soil-covered mound rises above the structure. Approximately at the crown of the vault is a stone pedestal surmounted by an urn. Built about 1805, this ice-house remained in use until c. 1900 (Beamon and Roaf, 1990, page 498; Headley and Meulenkamp, 1986, page 482.)

Westrop Cottage, formerly attached to Westrop House, Wiltshire (SU 199924) seems to have had a keen or eccentric owner who liked serpentine passages lined with rock, linking other garden features, including a 'garden chamber,' as well as two ice-houses. Where these passages cross there is plasterwork, giving a 'grotto' or ornamental effect' (Beamon and Roaf, 1990, page 454.) Hawkstone Park, Hodnet, Shropshire (SJ 580296) is somewhat different as there are a number of follies in the Park, one of which has a semi-circular opening at one end of a deep tunnel-shaped ravine cut into the red sandstone. This structure, possibly dating from 1780, is popularly called 'The dungeon', but was most likely used as an ice-house (Beamon and Roaf, 1990, page 385; Jones, 1979, page 79.)

Others were decorated with rockery mounds as at Timsbury House, three miles north-west of Radstock, Avon (ST 6658.) A castellated superstructure was erected at Woburn Abbey (Bedfordshire)(SP 963318.) And perhaps I can be forgiven for mentioning the 'goody-goody sweetshop' with its up-to-date frontage, also at Woburn? The ice-house at Old House Green, Cheshire (ST 844582) was dressed like a grotto, and included a statue over the entrance tunnel (Beamon and Roaf, 1990, page 222.) None of these are true follies.

Conversions of ice-houses into grottoes are known. At Locko House, Locko Park, four miles north-east of Derby (SK 412385) the well of the ice-house has been filled, a concrete floor placed at the springing-line of the dome, and a window and fireplace inserted. Externally, a castellated brick façade was added. Doubtless, the conversion took place once the ice-house was redundant, probably at the beginning of the 20th century (Beamon and Roaf, 1990, page 237.) This site was not mentioned by Jones (1979), or by Headley & Meulenkamp (1986.)

A structure at Duntish Court, Castle Hill, Dorset (ST 692068) was turned into a grotto, and is difficult to recognize as a former ice-house chamber (15 feet [4.61 metres] by 10 feet [3.08 metres].) It has an arched ceiling, now covered with artificial stalactite and crystals.

Ice Houses associated with Grottoes and Follies

A false front was fitted to the west side, with a double entrance archway, two arches and two doors (for improved insulation. Originally the entrance faced north. The Court was built in 1760, on the site of a much older house. The date of the ice-house is thus problematical, as is that of its conversion to a grotto (Beamon and Roaf, 1990, page 247.) Stackpole Court, three miles south of Pembroke, Dyfed, Pembrokeshire (SM 972963), is also a grotto converted from an ice-house. The top of the brick vault, over six feet (two metres) long is still visible (Beamon and Roaf, 1990, page 530.) There is no doubt about the Broxbourne Bury, Broxbourne, Hertfordshire (TL 385074) example. The badly vandalized ice-house, in a wooded dell called Ice-house Grove, was converted at some time into a grotto. Seashells had [have] been applied to the ceiling, and a stone seat placed within. Decorative stonework was added, parts of which remain littered about the site (Beamon and Roaf, 1990, page 294.)

I will now mention a reverse situation, where a shell grotto, close to Scraptoft Hall, Leicester Polytechnic (SK 6405) has reputedly been converted or partially converted into an ice-house. At this site a mound, made of earth excavated in forming a lake, covers the structure in question. This appears to be a case of creating landscape features (lake and grotto) and useful structure (an ice-house) simultaneously, although it has been suggested that this was never in fact used for ice storage. It is shewn on an estate map of 1781 (Beamon and Roaf, 1990, page 330.)

Similarly, at Carshalton House, Sutton, Greater London (TQ 2764) there is a mounded-over structure known today as 'the Hermitage' which is presumed to contain a converted ice-house. This is to the rear of a garden folly built in chalk, facing north, and reportedly filled-in during the 1920s when it was converted into a chapel. The structure lies within the grounds of a Roman Catholic girls' school. Recent work by the Carshalton House Garden Study Group has revealed an early to mid-18th century circular cement-rendered chamber, although the floor has yet to be excavated (Beamon and Roaf, 1990, page 270.)

Although Headley and Meulenkamp (1986) refer to a 'gothic gateway' to Croft Castle (National Trust), near Leominster, Herefordshire and Worcestershire (SO 4465), there is no mention of a grotto. However, it has been reported to me by a reliable source (Geoffrey Locke, pers. comm.) that there was a structure more likely to have been a grotto than an ice-house, although no further details are to hand (Beamon and Roaf, 1990, page 285.)

There are quite a number of superstructures, being functional granaries, game-houses, fish-bothies, and dovecotes, incorporated into or built over ice-houses, and most of them not classifiable as follies. There were ice-houses under the Temple of the Four Winds (SU 832942), presumably by Revett (Jones, 1979, page 103), and the Temple of Venus on the West Wycombe site, Buckinghamshire (SU 830945)(Beamon and Roaf, 1990, pages 210 - 11.) Wilbury House, Newton Toney, Wiltshire (SU 222413) had an octagonal 'temple' sited on an earth mound, rendered walls on an ashlar plinth, sash windows, and a leaded domed roof. Tuscan columns with 'frosted' necking bands were attached to the angles of the walls. The mound is thrown up over a partly buried ice-house, which could not be claimed to be typical, because its domed vault is laid in alternating concentric courses of rough flint and stone, with intermittent projecting blocks as ornament. It is entered from the east by a segmental arched tunnel of flint and stone. This structure is claimed to be a grotto by Headley and Meulenkamp, and there is no mention of an ice-house (Beamon and Roaf, 1990, page 454; Headley and Meulenkamp, 1986, page 67.)

There is also a possible ice-house, or possible folly, at Fonthill House, Fonthill, Wiltshire (ST 934315) where a structure, perhaps an ice-house, consisting of a large domed chamber is connected in two directions with large galleries leading to the surface. In places, the natural (rock-cut) roof is evidenced. There are ornamental grottoes nearby, and this may be yet another such (Beamon and Roaf, 1990, page 449; Headley and Meulenkamp, 1986, page 71.)

Towers often present problems. Amongst tall trees, on a ridge just outside Remenham, near Henley-on-Thames, on the Berkshire / Oxfordshire border (SU 770840)is the ruin of a little-known flint tower. Barbara Jones thought it was an ice-house, but stated '.. but looks more like the relics of a folly tower', and there are several other follies on the Park Place estate. I have listed it as an ice-house, with reservations (Jones, 1979, page 289; Beamon and Roaf, 1990, page 204.)

Some towers, one or two of them really decorative, are difficult to classify. Therefore, I will mention only a few. At Penrhyn Castle, Llandygai, Gwynedd (SH 602719 no. 1) there is the 'Thomas Hopper' ice-house tower, built about 1820 (Beamon and Roaf, 1990, page 535.) In Scotland, at Lunan House, Tayside (NO 689516) there is a decorative tower over the entrance; and at Cardinal Beaton's tower at Monimail, Fife (NO 299142) there is an ice-house in the basement. The vault at Lunan House was used for storing ice in the 19th century (Beamon and Roaf, 1990, page 477), but was not built for that purpose.

At Lee Hall, at Wark-on-Tyne, Northumberland (NY 862797) there is, on a cliff above the North Tyne, a stone-vaulted ice-house under a gazebo cut into the local sandstone rock. In the 19th century the superstructure, a tower commanding a view upstream, was used as a Turkish bath, suffered a fire, and

Ice Houses associated with Grottoes and Follies

subsequently lay ruinous (Beamon and Rolf, 1990, page 368.)

Another striking example, at Finedon Hall, Northamptonshire (SP 910718), is probably better described as an 'ice-tower.' Ice was stored in a circular vault, approximately 16 feet four inches [five metres] deep, over which the tower stands. This building has recently been incorporated into a dwelling (Beamon and Roaf, 1990, page 363.) A true ice-tower, where ice was stored above ground, is known from Sluipwick in the Netherlands.

I conclude this section with the slightly different ice-house - grotto association to be found at Dunraven Castle, Southerndown, Glamorganshire (SS 889928.) where, by the ruins of the mansion, is an ice-house covered by a mound spreading 19 feet six inches [six metres] from the base of a castellated folly tower that has served as a summer-house. Both were probably constructed between 1840 - 57 during major building conversions here, but there is no direct link between the two structures (Beamon and Roaf, 1990, page 531.) Should they be taken as a whole?

ICE SOURCES

The source of ice was likely to be the local pond, lake, or canal - hardly hygienic if intended for ice-cream! There were also some ingenious arrangements, for example at Great Moreton Hall, Cheshire (SJ 840595) there is an ice-house (presumably built with the Hall, c. 1840) under a mound attached to, and originally entered via, a mock-castle gatehouse, under a now roofless hexagonal tower. Perhaps this should be classified as a folly. It lies at the north east corner of a walled ornamental garden, 244 feet [75 metres] east of the Hall. The entrance has recently been unblocked, and exposed in good condition. An interesting feature here is that instead of the ice-house being located near a pond, it adjoins a small paved courtyard with a paved central gully drain. This courtyard was, it seems, designed to be artificially flooded in winter to form a shallow square of ice. The ice was in due course shovelled through a special slot in the wall into the ice chamber (Beamon and Roaf, 1990, page 220.)

At Hanbury Hall, near Droitwich, Herefordshire and Worcestershire (SO 945639) the ice-house reputedly held 24 tons of ice, obtained from a nearby purpose-built shallow rectangular freezing-pool sheltered by evergreens, and fed by water via sluices from two other ponds (Beamon and Roaf, 1990, page 286.)

Possibly the most unusual ice collection method was recorded by Louisa Arrowsmith (Healey, 1984) in her diary:

'1822 August 8. A most terrible Hail Storm with Thunder & Lightning from the West. I never saw the Hail so large, indeed they were pieces of Ice .. The Ice hailed for two hours. The Gardeners took up two barrows of Hail which we put in the Ice House'

This was at Totteridge Park, Greater London (TQ 234942.)

Once the winters in Britain warmed up, particularly in the 19th century, the way was opened for a thriving ice importation business. The first cargo from Norway was shipped to London in May 1822. Other cargoes were imported from North America into Britain via Bristol and Liverpool, as well. The development of the railways greatly assisted the distribution of ice throughout the country.

ICE-HOUSES TODAY

Various interestingly constructed ice-houses survive, but every year more and more are destroyed. All that can now be seen, on many estates, is an overgrown mound, as for example in the grounds of the Northampton Record Office (once Delapre Abbey) at SP 761591. Some, like the Deene Park, Northamptonshire (SP 941928) example have been filled-in recently, as a hazard to children and animals. A dilapidated example at Goodnestone, Kent (TR 254538) is gradually being both vandalised and eroded by nature.

RECOGNISING ICE-HOUSES

Quite a number of ice-houses are not recognised for what they are, or were, particularly when omitted from Ordnance Survey maps and plans, and even from estate maps. It seems they were no more thought of then, than the common refrigerator or deep-freeze in our kitchens today. Except for insurance reasons, how often does the ordinary householder consider making an inventory of her or his kitchen equipment?

Other structures, such as 'tatty' houses, root cellars, water cisterns, slurry pits, or hydraulic ram housings, can resemble ice-houses. If plans, especially from estate documents, are non-existent, it is rarely possible to find out if a building had one specific purpose, or had been adapted to a different one. And if, for example, the site chosen for an ice-house in the first place turned out to be unsuitable, then the structure, as a 'failed ice-house,' was promptly abandoned.

Ice can be kept in several ways, in stacks above ground surrounded by saw-dust, or in the ordinary cellar of a dwelling. In both instances, without historical documentation it is virtually impossible to determine where such stores existed since melting ice leaves little or no evidence in the archaeological record. If, as sometimes happens, the storage chamber or cellar is cut in chalk or sandstone, which allows natural drainage, even a drain would be unnecessary and that clue would not exist.

CONCLUSION

Warmer winters, with the consequent lack of natural ice, the expense and cartage of imported ice, two World Wars, and the gradual introduction of mechanical and chemical refrigeration from 1834 onwards caused the eventual demise of the ice-house. Many redundant ice-houses have found numerous changes of use, apart from conversion to grottoes. Recorded new uses include water cisterns, silage pits, donkey stables, summer-houses, stores for garden tools, garages, and even nuclear fallout shelters. Once built, an ice-house is difficult to destroy completely. Even if the superstructure has gone, the pit usually survives intact below ground level.

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Berry Hill Ice-House Taplow Buckinghamshire

Jonathan GILL, Oxford Archaeological Unit, Janus House, Osney Mead, OXFORD OX2 0ES

Abstract: This paper describes and places on record what is interpreted as a late 19th century ice-house at Taplow, demolished in the course of flood alleviation works.

Keywords: England / Buckinghamshire / Taplow / ice-houses

INTRODUCTION

In the Summer of 1998 the Oxford Archaeological Unit undertook a programme of structural recording on a 19th century ice-house (NGR SU 9070 8132) to the east of Maidenhead, and 0.5 km south-west of Taplow, Buckinghamshire. The work was in advance of the removal of the structure as a part of the Maidenhead, Windsor, and Eton Flood Alleviation Scheme. The initial recording was done in July 1998, before site work started, with further recording undertaken as part of a watching brief during demolition in October 1998. The recording consisted of hand-measured survey at scale 1:20, photography, and descriptive notes. A copy of the report has been lodged with the Buckinghamshire Sites and Monuments Record [SMR.]

Before the work, surprisingly, the ice-house was unrecorded, despite its location little more than 10 m from the main A4 road between Maidenhead and Slough. It was not included in the SMR, or in the gazetteer in Beamon and Roaf's The ice-houses of Britain, or referred to in Berry Hill's listing in English Heritage's draft Register of Parks and Gardens.

HISTORICAL BACKGROUND

The ice-house was within the grounds of Berry Hill, laid out between 1856 and 1860 by John Marnock after the purchase of the estate by John Noble. This small rectangular estate had previously formed part of the Taplow Court estate, on the south-facing slope of Taplow Hill.

DESCRIPTION

The Berry Hill ice-house consisted of three barrel-vaulted brick-walled chambers, each one at a lower level then the previous. At the time of the survey, the structure was in a relatively good condition, although it appeared to have been used as an informal rubbish dump in recent years. The full length approximately north - south was 6.45 m, and the width 1.81 m (internal dimensions.) Generally yellow bricks, many frogged, were used, of a rough and imperfect nature with wide joints. Both the vaults and the axial walls on which they rest were two bricks (22 cm) thick, with no cavity. The cross walls were three bricks (33 cm) thick. Each of the vertical walls was in English bond. Although much of the structure had been repointed with a hard cement mortar, the original soft mortar was visible in parts. Each chamber was roughly square in plan, the highest principally being a porch and the lowest being where the ice was packed. The central chamber may possibly also have had ice stored in it, or may have been used to allow easy access to the ice below.

Although the ice-house was largely underground, it was covered with a substantial mound. The entrance was surrounded by a simple brick arch with a projecting rim. Immediately within the first vault there was a clear indentation, and bricks roughly knocked off showing where the ice-house was probably formerly sealed each year.

One of its more interesting features was a narrow (0.25 m x 0.23 m x 1.63 m high) brick-lined ventilation shaft from the lower chamber to the top of the mound covering the structure. This feature confirms a 19th century date for the ice-house, as before the 1840s it was assumed that to be efficient an ice-house had to be tightly sealed. This belief began to be challenged, largely as a result of exposure to differing practice in America, where the importance was appreciated of ensuring the release of noxious (and warm) fumes from the rotting straw. Ventilation shafts were sometimes also used to fill the chamber with ice and remove it in summer. It is possible (although unlikely) that at Berry Hill the chamber may have been filled by this method, but clearly impossible that the ice would have been removed through the narrow shaft.

At the time of the initial survey, the floor of the lowest section was covered by a thick layer of sludge, but the watching brief revealed that the floor was formed of three courses of brick and that there was a cast iron pipe entering the chamber at the base of the curved rear wall. The pipe appeared to slope towards the ice-house, so it could not have been to drain away melted ice; it is likely to have been a drainage feature added after the structure ceased functioning as an ice-house.

It is usual for there to be a drain at the base of an ice-house to allow meltwater to drain away, but no such feature was identified at Berry Hill. The surrounding subsoil is free-draining gravel, and it may be that the bricks in the floor were laid 'dry' (without mortar) to allow meltwater to seep away. However as a result of health and safety considerations the watching brief during demolition was undertaken from a distance, and it was not possible to determine if these bricks were laid in mortar or not.

Immediately to the east of the ice-house was a square-plan brick chamber with two pipes entering from the north and east. There appeared to be no physical connection between this feature and the ice-house, and it was constructed of later brickwork with a distinctly different grainy mortar. It appears to have been a later drainage or overflow feature, not functionally related to the ice-house.

INTERPRETATION

The ice-house at Berry Hill is of a typically 19th century form. It was built at a period when scientific and technological advances had allowed a variety of modest and relatively cheap forms in contrast to the earlier standard egg-shaped chamber. Its location may also be indicative of the later 19th century when it was becoming more common to use imported ice, frequently from the United States or Norway, rather than from a local lake. The ice-house at Berry Hill is located close to the southern end of a lake, but if it was to be entirely filled from that source it would have been more logical to have had it at the northern end, closer to the house. As built, it was close to both the lake and the main road from which imported ice could easily have been delivered.

The physical evidence all points towards the ice-house being of mid- to late 19th century date, and it is tempting to assume that it was constructed as part of the landscaping undertaken at Berry Hill between 1856 and 1860. However, the first edition six-inch Ordnance Survey map, of 1875, does not show the ice-house (although another is shown some 600 m to the north, at Taplow Court) suggesting that it may have been a slightly later addition. In addition, some sale particulars from 1874 which describe the garden do not mention an ice-house, despite detailing many other gardens features such as rustic bridges, an ornamental boathouse, secluded walks, rockery work, and an ornamental lodge. It would be surprising if a document such as this would overlook an ice-house, and it is more likely that it was constructed in the last quarter of the century.

Berry Hill Ice-House Taplow Buckinghamshire

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Strange Engraved Stones from a wall in Burwell Cambridgeshire.

Sylvia P. BEAMON MA (Cantab)

Abstract: This paper discusses carved chalk stones discovered in a wall at Burwell (Cambridgeshire), theories concerning their origin and date, and their actual relationship to the carved figures in Royston Cave (Hertfordshire.)

Keywords: Carvings / clunch / dating / provenance

A DISCOVERY IN BURWELL

In 1977, in Low Road in the small village of Burwell, Cambridgeshire (TL 5866), ivy was disturbed on an old clunch-built wall about to be demolished. Clunch is a hard chalk, used as a building-stone. Several carved stones were exposed, including a figure resembling the Virgin Mary, a tree, and a double heart. These excited considerable interest locally. The owners of the walled garden, Mr. and Mrs. P. Smith, contacted the author, who photographed the carved stones in-situ. It was assumed that the stones had been 'quarried' (or re-used) from a previous standing building before being incorporated into the wall. If carved in-situ, the carver would have had to adopt an awkward and uncomfortable position, on his knees. This was the first occasion that a double heart carving, in particular, had been seen in this district; and Burwell had connections with the Knights Templar.

ROYSTON CAVE

The author has for many years been researching the small bell-shaped Royston Cave (Scheduled Ancient Monument Hertfordshire 7 (TL 357408)), a man-made excavation close to the cross-roads in Royston town centre. This 'cave' is cut into the solid chalk, and its walls are covered with carved crucifixion scenes, religious figures, and other signs and symbols including single, double, and triple hearts, dated to the Medieval period. There are various theories as to the origin and function of Royston Cave, but the author is of the opinion that at one time the distinctively demarcated upper level, with an inserted timber floor, was possibly used for the secure storage of market goods, and the lower area used as a chapel by the Knights Templar (1118 - 1308.) There is similar artwork in the Tour du Coudray at the Chateaux de Chinon in the Loire valley (France), where Templars were imprisoned, and in that town's Templar House. Royston is about 35 km south-west of Burwell.

GEOFFREY DE MANDEVILLE

In 1144, Geoffrey de Mandeville had died at Burwell Castle as a result of a head wound suffered in a local skirmish. The Templars dressed Geoffrey in his cloak and took his body, in a leaden coffin, to their Temple Church in London, where is lay for some time in the garden; some accounts say it was hung from a tree. The body could not be buried in consecrated ground, as Geoffrey had been excommunicated as a result of his having sacked Ramsay Abbey. Years later, after a pardon and absolution, the body was buried within Temple Church. William Stukeley (1743 and 1746), the first antiquarian to write about the Cave, attributed the

Strange Engraved Stones from a wall in Burwell Cambridgeshire.

carvings to Geoffrey's wife, Lady Roysia de Vere and (erroneously) believed she was buried at Royston. It is probable that she had lived at Newsells Manor, near Royston, while her husband was in the fens. Speculation, therefore, was high.

THE BURWELL CARVINGS' ORIGIN REVEALED?

The author wrote to the editor of Clunch, the Burwell village magazine, requesting further information about the carved stones. An enlightening response was received, in July 1980, from Peter Winn, of London.

'I was conducting some research recently at the village of Burwell, Cambs. into the life of the nineteenth-century dramatist and song-writer Edward Fitzball. Fitzball was born in Burwell and lived at the house now called "The Poplars" on Low Road between 1798 and c. 1812 ..

I thought you might be interested to hear Fitzball's own explanation for the carvings (or at least one of them) which, if true, I am afraid will considerably reduce your interest in them. I enclose therefore, a copy of the pages in Fitzball's autobiography, Thirty-five years of a dramatic author's life, published in 1859, in which he describes a return visit he made to his home, probably in 1827:

"One thing amused me during my stay. As a matter of curiosity, they showed me, at Burwell, a small statue resembling the Virgin, carved in an ancient wall, which they said had been recently discovered, and proved, beyond a doubt, that this wall had formerly been part of either a nunnery or a chapel. It might have been, so far as regarded the wall, but for the Virgin, she remained as a specimen of my own handiwork when I was a lad. So you see how your antiquarians may be misled or bewildered. There is an old cave at Royston in Herefordshire [sic], which you are permitted, for a trifle, to descend, by a private entrance, there being no other, through a house. In this gloomy retreat, it seems, a lady hermitess lived in the days of Thomas à Becket, She died in this cave; her tomb is there, with her effigy above it. It was an imitation of this effigy, cut by me in the wall, which was now mistaken for the Virgin of the supposed chapel."

'As you will see this account only refers to a carving of a Virgin but the reference to the Royston cave is presumably conclusive. Fitzball would have been between the ages of six and 20 when he lived at the house. He is sometimes inaccurate in his autobiography and inclined to romanticise his early life slightly but I have as yet found no case where he is deliberately misleading..'

What more can be said? This is a good example of how myths and legends start!

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Subterranea Britannica

Subterranea Britannica was founded by Sylvia Beamon in 1974, for the study of the archaeology and history of man-made or man-used underground spaces and structures. It was modelled on the pre-existing French and German societies, Société Francaise d'Étude des Souterrains and Arbeitskreis für Erdstallforschung, with which bodies it maintains formal links, as it does also with the Société Belge de Recherche et d'Étude des Souterrains and Groupe de Recherches Souterrains en Milieu Artificiel (Belgium), Studiegroep Onderaardse Kalksteengroeven (The Netherlands) and less formally with other societies and individuals having similar interests in Austria, Belgium, Croatia, the Czech Republic, France, German, Iceland, Ireland, Italy, The Netherlands, Poland, Russia, Spain, Sweden, and Ukraine.

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Subterranea Britannica

and now embrace underground mines and quarries, transport tunnels, other underground civil engineering works, and especially in recent years military and Cold War sites.

The Society's affairs are conducted according to its Constitution, adopted at the Annual General Meeting held at Cambridge

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The objects for which the Society is established are for the public benefit, to encourage and promote the study of all aspects of underground objects spaces and structures (whether excavations or structures or partly one and partly the other) of any kind or period made or used by human beings both generally and particularly within the British Isles and world-wide without precise geographical limitation.

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Barons' Cave Reigate, Surrey

From the literature …

ORIGINS OF THE 'BARONS' CAVE' STORY AT REIGATE, SURREY

Nothing remains of the 11th century castle at Reigate, sculpted from a sandy hill, other than the earthworks and, tunnelled into the hill, the so-called Barons' Cave. Nothing is known for sure about the origin or purpose of the cave, other than that it already existed in 1586 as it is mentioned by William Camden [1551 – 1623] in the first edition (in Latin) of his Britannia.

The local (and no longer seriously entertained) story that the 'cave' was the meeting-place of the Barons plotting against King John, shortly before the signing of Magna carta, appears to date only from 1661, when it appears in the first edition of The new State of England by Guy Miège [1644 – c. 1718]

The following text is from the third edition (1699) although much the same as in the first, if not identical..

Rygate. Rygate, or Reygate, a noted Town for the successful Battles fought there against the Danes, stands in a Vale called Holmes Dale. From whence is sent up to London, for the Clothiers Use, abundance of Fullers Earth, excellent in its kind. This Town shew's still the Ruins of an ancient Castle, with a long Vault under Ground, and a Room at the end of it, where 'tis said the Barons met in Council in their War against King John.

As the topographical gazetteer part of Miège's book has entries for places throughout the Kingdom, and as he was born at Lausanne and settled in London 1661 in when he was 17, it seems probable that his information is secondhand, and perhaps from an earlier published work not yet identified.

As Camden says nothing about the Barons, the story may have originated (that it to say, been made up) some time in the 105 years between 1586 and 1691. Perhaps Camden's mention led to the cave becoming a tourist attraction, and a 16th or 17th century 'cave guide' invented the story to enliven his guided tours?

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